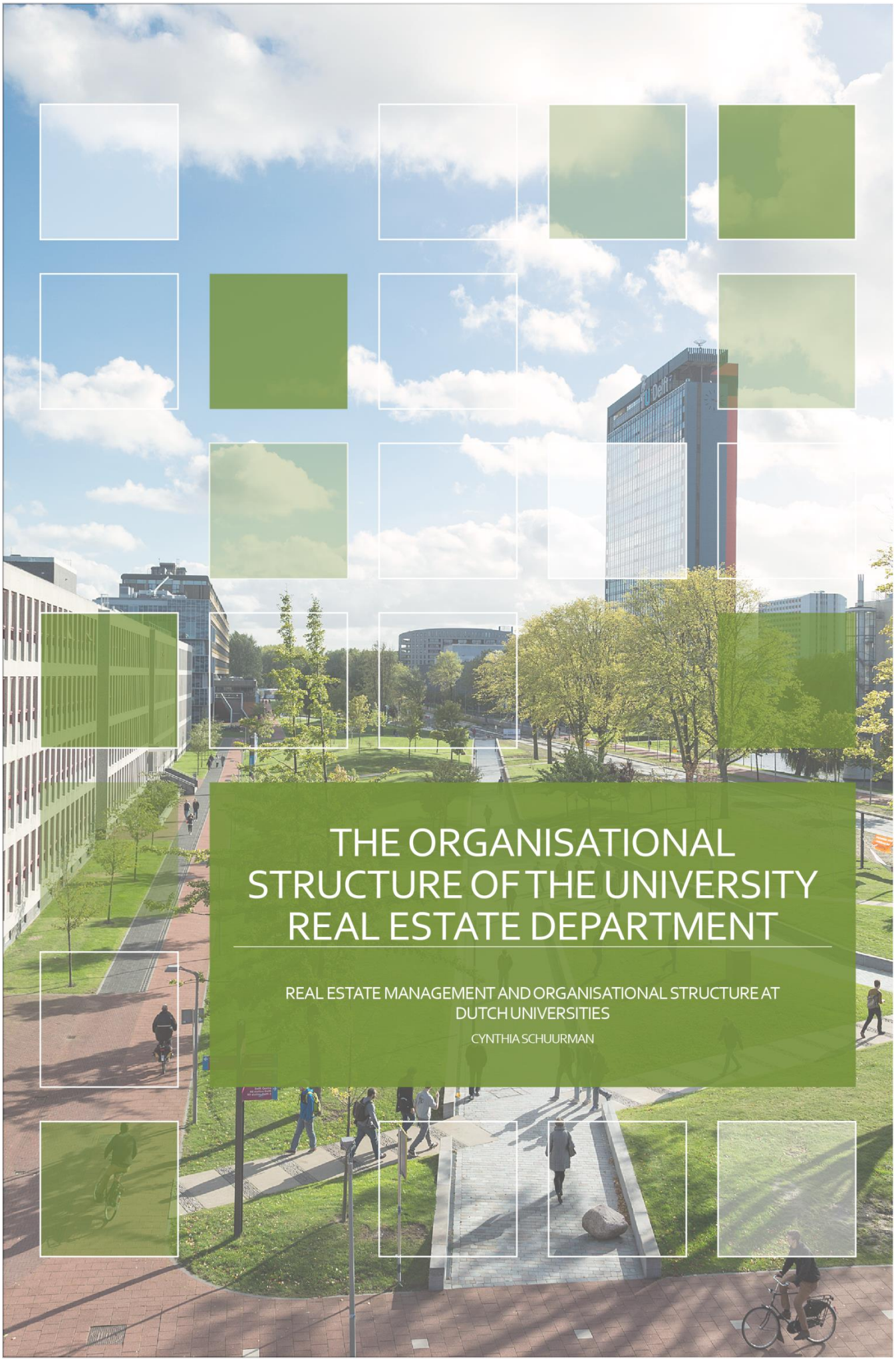

THE ORGANISATIONAL STRUCTURE OF THE UNIVERSITY REAL ESTATE DEPARTMENT

REAL ESTATE MANAGEMENT AND ORGANISATIONAL STRUCTURE AT DUTCH UNIVERSITIES

CYNTHIA SCHUURMAN

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GRADUATION MASTER THESIS

University	Delft University of Technology
Department	Management in the Built Environment
Laboratory	Real Estate Management
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PREFACE

Before you lies my master's thesis "The Organisational Structure of the University Real Estate Department", the basis of which is a study on real estate management and organisational structure at Dutch universities. The graduation thesis has been written as the final work of the Management in the Built Environment Track at Delft University of Technology. I was engaged in researching and writing this thesis from September 2018 to October 2019.

I have always had a passion for the built environment. During my bachelor's degree in Architecture it became clear to me that I wanted to do more than just design, and I became interested in the organisation and the management of processes in the built environment. From a deep personal interest for public real estate management, this thesis was created. The outline of the research and the main focus point were established together with my first supervisor, Alexandra den Heijer. Due to her expertise on Corporate Real Estate Management and Campus Management, she steered me in the right direction and was always a helpful source of new and relevant information. Although the graduation process was difficult at times, conducting this research has ended in me learning more than I could have imagined.

I would like to use this opportunity to thank both my supervisors for their support and patience during my graduation process. I also wish to thank all of the interviewees, without whose cooperation I would not have been able to conduct this research. The contribution of all interviewees have provided me, as well as the research field, with new insights into the working of the university real estate organisation and their management process.

At last, I would like to thank my friends, family and fellow students for their support and admiration during my graduation process. Their constant urge to continue and their belief in my qualities fostered the completion of this master's thesis.

I hope you enjoy your reading.

Cynthia Schuurman

Wateringen, October 29, 2019

MANAGEMENT SUMMARY

RESEARCH FRAMEWORK

University real estate organisations are heavily influenced by the context in which they operate. Within this dynamic context, real estate organisations choose a particular organisational structure. Changes in organisational context can imply a reconsideration of the organisational structure of the real estate department. As a consequence, university real estate organisations seek to attain the organisational structure that is most beneficial for their organisation and the management of their real estate. The corporate real estate management process is based on matching real estate with organisational objectives and adding value to organisational performance. Previous studies have therefore focused on aligning corporate real estate management with the core business of an organisation. However, many studies do not focus on the impact of the organisation on the real estate management process. As a consequence, university real estate organisations lack the information and tools to assess whether their organisation optimally supports the real estate management process. As the university real estate management process has become more complex, and financial resources have become rather limited in the last two decades (den Heijer, 2011), the question of which organisational structure optimally support the management of university real estate is of high relevance. This urges the need for new information and tools to assess the relation between organisational structure and corporate real estate management. This study therefore explores how the organisational structure of university real estate departments influences the university real estate management process.

The research aims to provide a better understanding of the relationship between organisational structure and university real estate management. The goal of the research is to contribute to the body of knowledge concerning the organisational management and corporate real estate management. The research objective is to provide university real estate organisations with a toolbox consisting of information and tools to support them in making decisions about the structuring of their organisation and the management of their real estate. The toolbox consists of three tools: (1) an analytical tool that determines the organisational structure of a university real estate organisation, (2) a model that assesses the university real estate management process, and (3) a model that determines which organisational structure is preferred based on specific conditions and priorities.

The problem statement and the research goals lead to the following main research question and sub-questions:

How does the organisational structure of the university real estate department influence the way university real estate is managed?

1. *What information about the context of university real estate organisations is relevant for managing university real estate?*
2. *What theories apply to university real estate management and organisational management?*
3. *What information and tools are available to assess the relation between organisational structure and university real estate management?*
4. *How is the concept of assessing the relation between organisational structure and university real estate management perceived and used by Dutch university real estate departments?*

RESEARCH METHODOLOGY

The research explores how the organisational structure of university real estate department influences university real estate management. the real estate management process. The explorative nature of this aim led to choosing a *case study approach* and a *qualitative research strategy*. The study uses three research methods to collect data: a literature study, a document analysis and empirical research. The study uses multiple cases to increase reliability of the results. The cases are selected based on a set of criteria. The following cases were found that matched the formulated selection criteria:

- *Delft University of Technology (TUD)*
- *Utrecht University (UU)*
- *Wageningen University & Research (WUR)*
- *University of Twente (UT)*

The study is designed in three parts:

PART 1 introduces the research topic, describes the context of Dutch university real estate organisations, and provides a literature study of the relevant theories for managing university real estate and organisational management. The context of university real estate organisations is also presented here. The literature study is used to create an analytical framework which is used for the case study analysis and cross-case analysis.

In **PART 2**, the analytical framework is used to analyse the findings of the case studies and cross-case analysis. In this part of the research, data is collected by a document analysis and empirical research in the form of semi-structured interviews. The case studies include a detailed analysis of the organisational structure of the real estate department and the university real estate management process

PART 3 concludes the study by presenting the toolbox and summarising the answers to all research questions and formulating a main conclusion. The limitations of the research are discussed and recommendations for future research are provided. The third part concludes the study by reflecting on the graduation project.

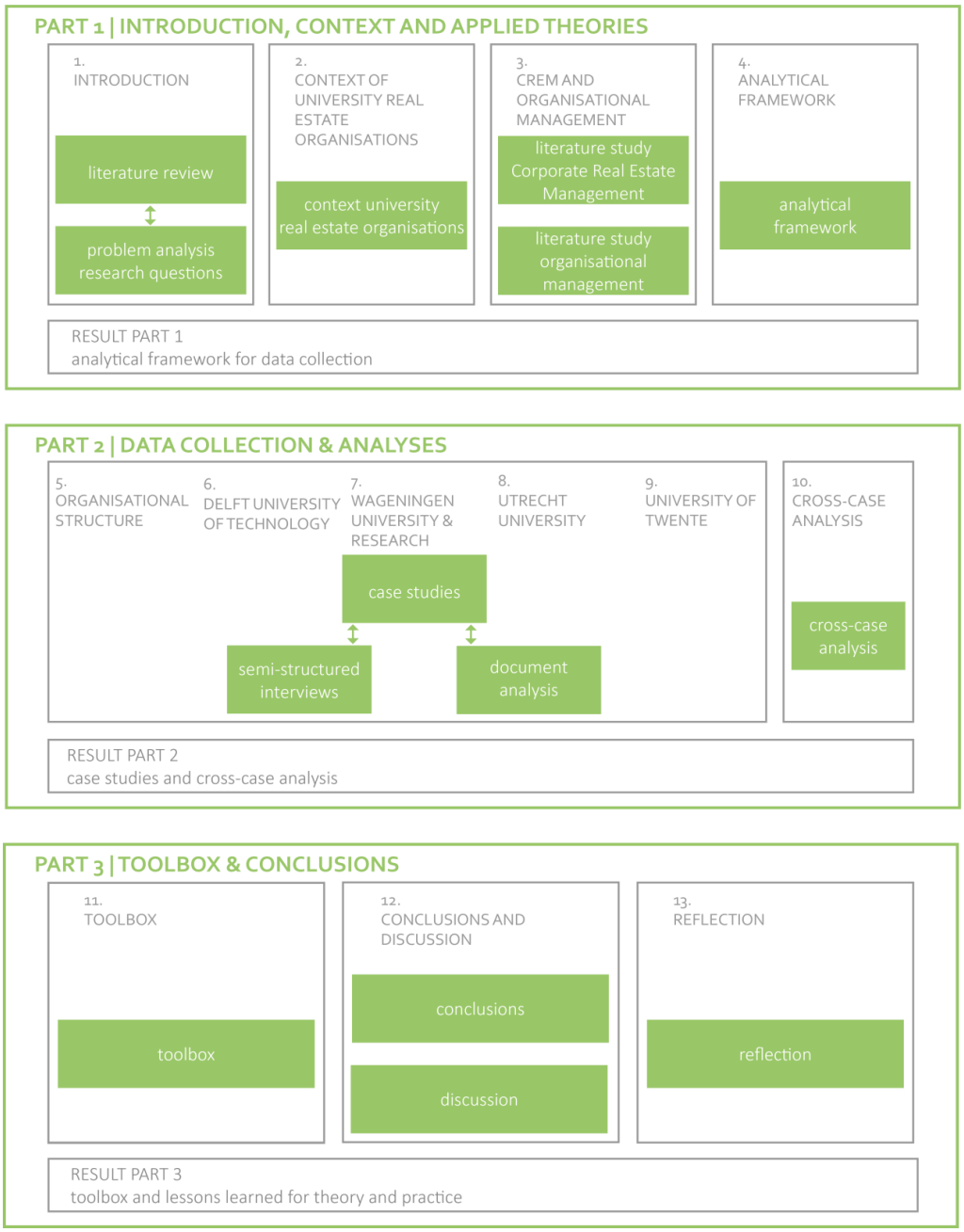

Figure I – Research design (own illustration)

ANALYTICAL FRAMEWORK

The literature study forms the basis for the design of an analytical framework. The analytical framework is used to analyse the findings from the document analysis and empirical research. The results of the case studies and the cross-case analysis are organised and presented by using the analytical framework.

In an attempt to combine the literature study in an analytical framework, it can be observed that the relationship between university real estate management and organisational structure consists of two dimensions: the role of real estate management within the university, and university real estate management. The role can be described by the organisational structure of the overall organisation and the real estate department. The dimension of university real estate management can be described by the integration of the four CREM perspectives in the real estate management process. In this study, the role of real estate management within the university can be defined by a set of five structural choices: the grouping of departments, the level of centralisation, the level of concentration, the level of sourcing, and the position of the real estate department. In this study, university real estate management can be defined by the development stage of the real estate department from each of the four CREM perspectives.

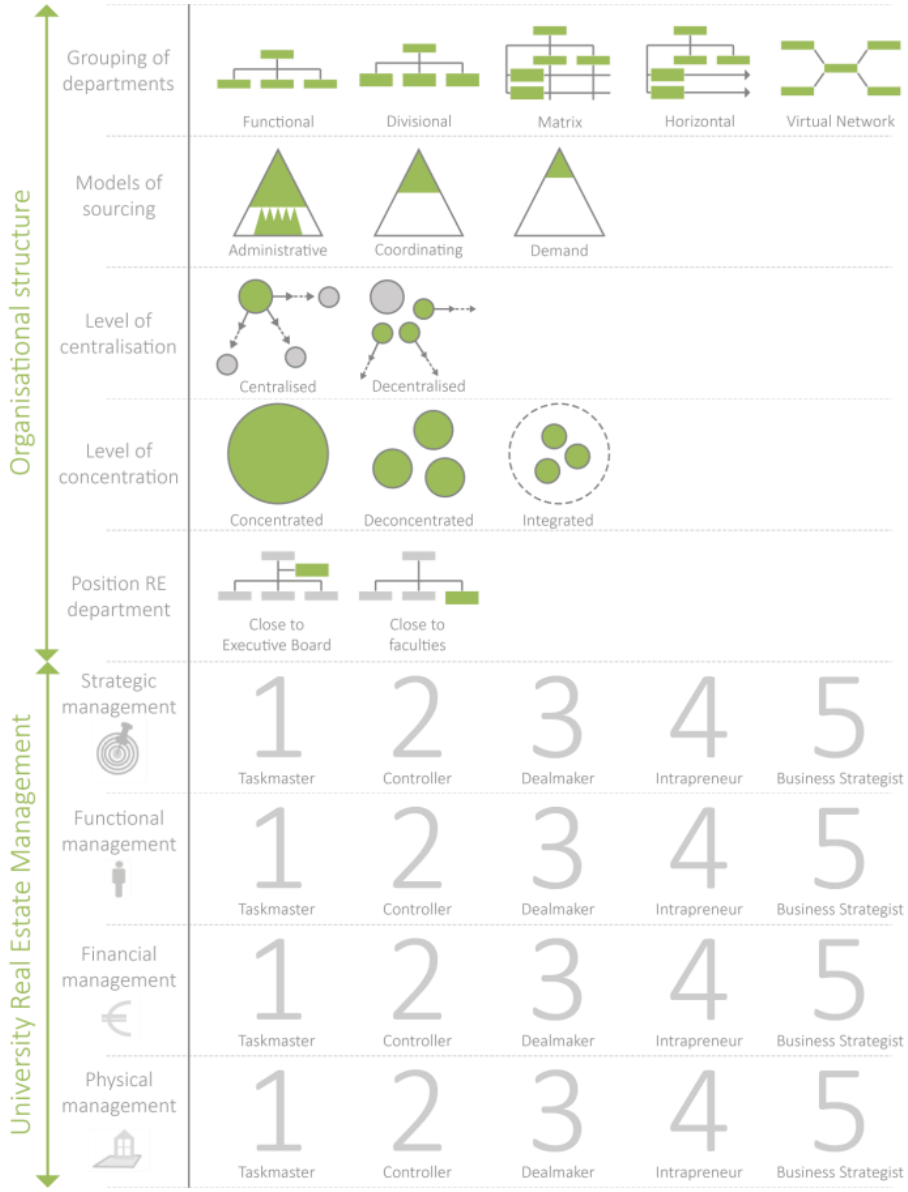

Figure II – Analytical framework (own illustration)

CASE STUDIES AND CROSS-CASE ANALYSIS

The case descriptions and cross-case analysis are too detailed to include in this management summary. The findings from the case studies are presented in Figure III as a visualisation of the analytical framework.

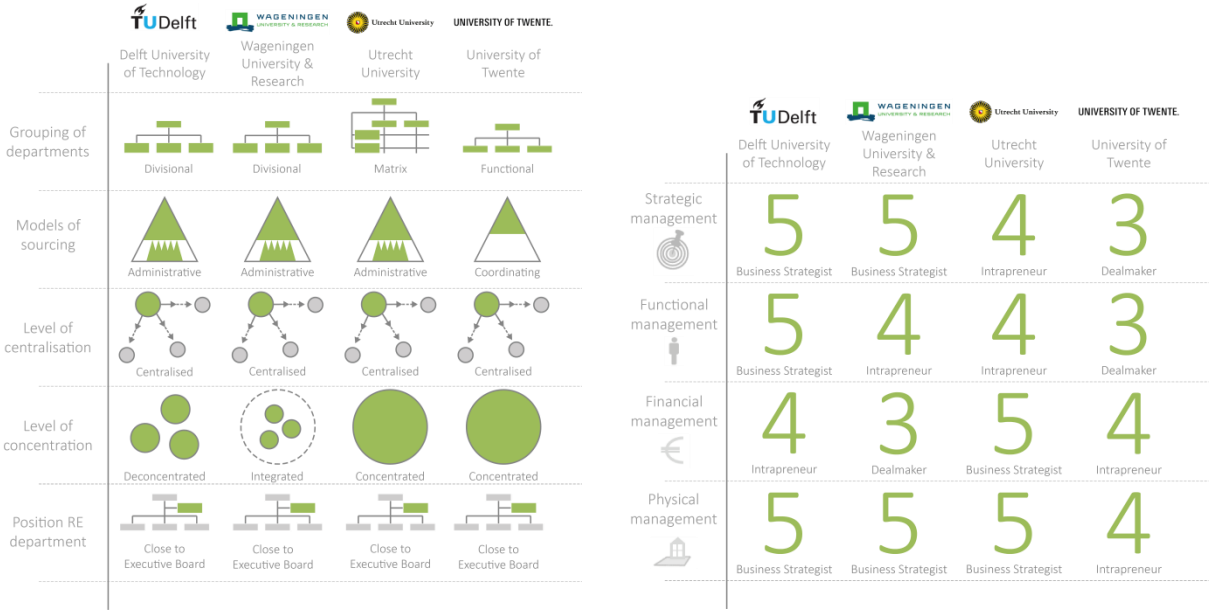

Figure III – Results of the case studies presented in the analytical framework (own illustration)

The main findings of the cross-case analysis are:

- Following from both the case studies and the cross-case analysis, no indications were found that the **grouping of departments** influences the university real estate management process.
- The **level of centralisation** influences the *strategic*, *functional* and *financial* management of real estate.
- The **level of concentration** influences the *strategic*, *functional* and *financial* management of real estate.
- The **level of sourcing** influences the *strategic*, *financial* and *physical* management of real estate.
- The **position of the real estate department** influences the *strategic*, *functional* and *financial* management of real estate.

TOOLBOX

The result of this research is the design of a toolbox consisting of information and tools to support them in making decisions about the structuring of their organisation and the management of their real estate. The toolbox enables university real estate departments to assess their organisation on both its structure and management process, and is intended to provide a reference for the relation between organisational structure and real estate management. The toolbox consists of three tools: (1) an analytical tool that determines the organisational structure of a university real estate organisation, (2) a model that assesses the university real estate management process, and (3) a model that determines which organisational structure is preferred based on specific conditions and priorities. The toolbox is presented in Table I.

	Purpose
Analytical Framework – Organisational Structure	determining the organisational structure of the university and its real estate organisation
Analytical Framework – UREM	assessing the university real estate management process
Assessment model	determining which organisational structure is preferred based on specific conditions and in a specific context

Table I – A toolbox to support university real estate management

Analytical framework – Organisational Structure

Determining how the organisation supports the university real estate management process and which organisational structure is preferred starts with an analysis of the current organisational structure of the university organisation. The analysis of the organisational structure will determine the role of real estate management within the organisation. The analysis consists of three parts: (1) an analysis of the organisational structure of the university, (2) an analysis of the organisational structure of the university real estate organisation, and (3) four structural choices: the level of sourcing, the level of centralisation, the level of concentration, and the position of the real estate department within the university. The four structural choices are the key part of this tool, and are presented in the analytical framework.

Analytical framework – University Real Estate Management

Determining how the organisational structure of the university and its real estate organisation impacts the university real estate management process starts with an assessment of the current real estate management process. The assessment of the university real estate management process will determine how well the four CREM perspectives are integrated in the real estate management process. The assessment model combines the five-stage development model of Joroff et al. (1993) and the four perspectives of CREM determined by den Heijer (2011).

Assessment model

In addition to determining the current organisational structure and assessing the university real estate management process, determining which organisational structure is preferred also requires an assessment which determines the organisation's specific conditions and priorities. After the organisation's conditions and priorities are determined, all arguments in favour of and against the structural choices should be considered. The toolbox is presented in Figure IV.

To determine which organisational structure is preferred, the following steps need to be followed:

(1) determining which added values of RE are pursued

(2) considering all arguments, both in favour of and against a particular structural choice

(3) determining which organisational structure is preferred

		Added value of RE	University Real Estate Management			
			Strategical	Functional	Financial	Physical
Level of centralisation	Centralised	* alignment between real estate and institutional goals and objectives	+	-	-	
	Decentralised	* alignment between real estate and primary process * reducing costs by efficient use of space	-	+	+	
Level of concentration	Concentrated	* economies of scale * strengthening the corporate identity of the university	+	-	+	
	Deconcentrated	* alignment between real estate and primary process	-	+	-	
	Integrated	* economies of scale * provision of uniform services and uninterrupted facilities * provision of improves services to customers and users	+	-/+	+	
Level of sourcing	Administrative	* keeping an overview and control over all activities * alignment between strategic, tactical and operational levels of university real estate management	+		-	+
	Coordinating	* cost reduction through economical savings and cost efficient external service providers	-		+	-
	Demand	* cost reduction through economical savings and cost efficient external service providers	-		+	-
Position real estate department	Close to the Executive Board	* alignment between real estate and institutional goals and objectives	+	-	-	
	Close to the faculties	* alignment between real estate and primary process * reducing costs by efficient use of space *	-	+	+	
Separating / Joining strategic and operational level	Separated	-	-		-	-
	Joined	* alignment between operational tasks and strategic policy * cost efficient * strengthening the corporate identity of the university	+		+	+

Figure IV – Assessment model for determining the preferred organisational structure (own ill.)

CONCLUSION

By combining the results of the study and the answers to the sub-question, the main research question can be addressed: *"How does the organisational structure of the university real estate department influence the way university real estate is managed?"*

Following the results of the study, it can be observed that different structural configurations do influence the university real estate management process. The organisational structure of the university real estate department can be determined by a set of five structural choices: (1) the grouping of departments, (2) the level of centralisation, (3) the level of concentration, (4) the level of sourcing, and (5) the position of the real estate department. Different structural choices will create different structural configurations.

To find the organisational configuration that supports the real estate management process, university real estate departments need to consider which added values they want to achieve. Adding value to organisational performance is the main focus of corporate real estate management. Added value can be created by:

- aligning real estate with institutional goals *(strategic)*
- aligning real estate with the primary process *(functional)*
- aligning real estate financial value, risks and costs with the production of real estate products and services *(financial)*
- aligning quantity and quality of current and future real estate with the accommodation demand (*physical*)

In this study, the added value of real estate is assessed by linking the four Corporate Real Estate Management perspectives with the five development stages of Joroff et al. (1993). The development stage of the real estate department determines whether the real estate department's behaviour and focus meets the university's current needs, or simply put: it determines how and which added value is created by the real estate management process.

To conclude, the organisational structure of the university real estate department influences the way university real estate is managed, as different structural configurations influence how the real estate adds value to organisational performance.

The study focuses on how organisational structure influences the way university real estate is managed. However, based on the findings, it can be concluded that there is a mutual relationship between organisational structure and university real estate management. Not only does organisational structure influence the university real estate management process, but the university real estate management process also influences the organisational structure. The case studies have shown that the university real estate departments have reorganised their organisation due to a changing demand in real estate services. The aim of the reorganisations was to create added value to organisational performance.

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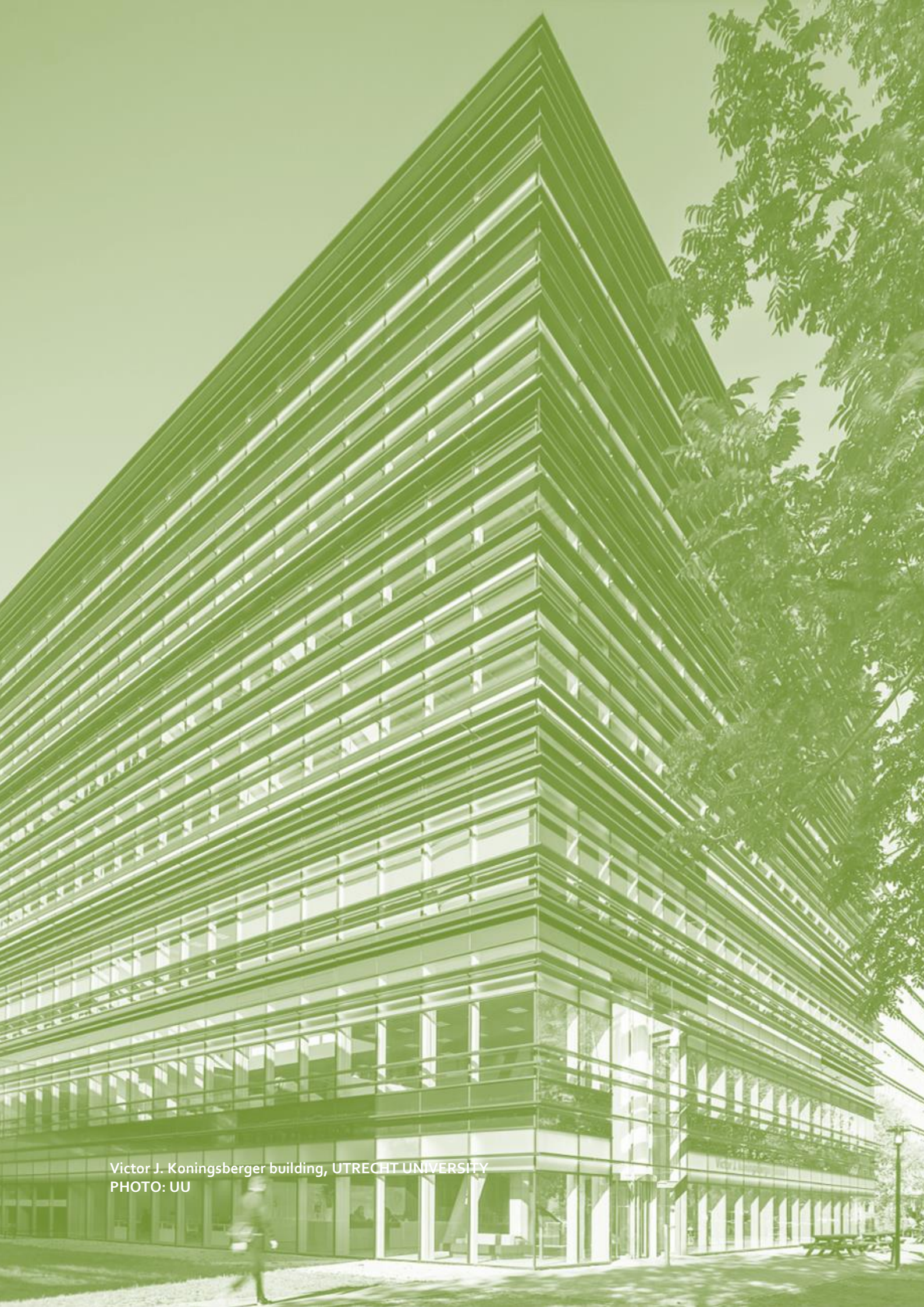
INTRODUCTION, CONTEXT & APPLIED THEORIES



Victor J. Koningsberger building, UTRECHT UNIVERSITY
PHOTO: UU

CHAPTER 1 – INTRODUCTION

1.1 RESEARCH FIELD

As universities operate in a constantly changing context, the way university real estate is managed constantly changes as well (Evers, van der Schaaf & Dewulf, 2002). Within this dynamic context, real estate organisations choose a particular organisational structure. Changes in organisational context can imply a reconsideration of the organisational structure of the real estate department (Bank & den Heijer, 2004; Evers, van der Schaaf & Dewulf, 2002; van der Zwart, 2014). When reconsidering this, real estate organisations seek to attain the organisational structure that is most successful in supporting their real estate management activities, achieving their organisational objectives and adding value to their organisational performance (Bank & den Heijer, 2004; Daft, Murphy & Willmott, 2010). Since the overall structure of an organisation affects the processes by which real estate decisions are made, and thereby also influences the real estate management activities (O'Mara, 1999), the organisational structure of university real estate organisations plays a significant role in university real estate management.

During the past decades, the profession of managing corporate real estate has undergone a drastic evolution (Krumm et al., 2000). The discipline has evolved from being a necessary burden to a professional discipline contributing to the performance of the organisation as a whole (den Heijer, 2011; Dewulf et al., 2000; Joroff et al., 1993; Krumm et al., 2000). Corporate Real Estate Management (CREM) is based on the proposition that corporate real estate adds value to organisational objectives and organisational performance (den Heijer, 2011; de Vries, 2007; Dewulf et al., 2000; Krumm et al., 2000). Previous studies have therefore focused on aligning CREM with the core business of an organisation (see Lindholm, Gibler & Levaïnen, 2006; Nourse & Roulac, 1993; Roulac, 2001). However, many studies mainly focus on how corporate real estate adds value to organisational performance without considering the mutual relationship between CREM and organisational performance. The result is that real estate organisations focus on matching the corporate real estate management process with their organisational objectives and goals, without assessing whether the organisation optimally supports the corporate real estate management process. However, previous studies also revealed that there is no universal consensus on the optimal position of corporate real estate management within an organisation (O'Mara, 1999; McDonagh & Hayward, 2000; OECD, 2017; van der Schaaf, 2002; Evers, van der Schaaf & Dewulf, 2002). The OECD (2017) study states that the success of an organisational structure depends on how the relation between different departments are managed. Additionally, McDonagh and Hayward (2000) conclude that for some aspects of organisational structures it is very difficult to measure the success, and it will be only after years of performance before a valid judgement can be made about the success. Therefore, the focus should not be on the optimal organisational structure, but on what organisational structure is preferred in certain situations and under certain conditions.

The evolution of the corporate real estate management profession into a professional discipline can also be noticed in the university real estate sector. Corporate real estate management within Dutch universities has become a more complex and challenging process, with more stakeholders, opportunities and threats to consider (den Heijer, 2011). According den Heijer (2011), real estate management is more successful when the real estate manager considers all stakeholder perspectives in real estate decisions.

To illustrate the importance of the mutual relationship between the organisation and the corporate real estate management process in the university real estate sector, the organisational context of the Dutch universities before 1995 can serve as an example. Before 1995, the Dutch government owned all university real estate properties, and was thus responsible for the Dutch university real estate portfolio (Arkesteijn & de Jonge, 2012; den Heijer, 2011). This situation can be described as the separation of the institutional focus and the real estate focus of CREM; the Dutch government was responsible for the financial and physical perspectives of CREM, and the universities for the strategic and functional perspectives. The separation of the different perspectives resulted in a mismatch between the demand and supply for real estate (Arkesteijn & de Jonge, 2012; den Heijer, 2011). As the Dutch government was responsible for the financial and physical aspects of the real estate portfolio, the universities were not aware of the costs, and therefore did not use their space efficiently (Arkesteijn & de Jonge, 2012; den Heijer, 2011). In short, the organisational context of the universities negatively influenced the university real estate management process by separating the different perspectives of CREM. The example shows that organisational management and corporate real estate management are more integrated than one would initially think.

To conclude, university real estate management is influenced by the context in which the university operates. As the university real estate management process has become more complex, and financial resources have become rather limited in the last two decades (den Heijer, 2011), it has become more important to assess how the organisation supports the university real estate management process. However, previous studies have shown that university real estate organisations lack the information and tools to do so. To fill this gap in literature, this study investigates how the organisational structure influences the university real estate management process.

1.1.1 SOCIETAL RELEVANCE

Since the Dutch universities became owner of their real estate portfolio, and became responsible for their own accommodation, the management of university real estate has become more complex (Bank & den Heijer, 2004; den Heijer, 2011). Decreasing public involvement and funding for universities puts pressure on the internal allocation of financial resources (Bank & den Heijer, 2004; den Heijer, 2011). Due to this changing context, the question of which organisational structure supports the management of university real estate is of high relevance. By gaining knowledge on the organisational structure of university real estate departments and the influence that the organisational structure has on the university real estate management process, universities and other public organisations could make better decisions regarding their organisational structure and the management of their real estate.

1.1.2 SCIENTIFIC RELEVANCE

The CREM discipline has evolved in the last two decades, which caused the body of knowledge on CREM theory to grow rapidly. Since CREM is based on the proposition that corporate real estate adds value to organisational objectives and organisational performance (den Heijer, 2011; de Vries, 2007; Dewulf et al., 2000; Krumm et al., 2000), previous studies have focused on aligning corporate real estate management with the core business of an organisation (see Lindholm, Gibler & Levaïnen, 2006; Nourse & Roulac, 1993; Roulac, 2001). However, many studies mainly focus on how corporate real estate management influences and adds value to organisational performance without considering the mutual relationship between CREM and organisational performance. A number of studies have examined this mutual relationship (see Matser, 2018; van der Zwart, 2014; Wu, 2015). Matser (2018) developed an analysis framework to assess the organisational structure of corporate real estate department in multinationals. Van der Zwart (2014) developed a meta-model for aligning CREM to organisational management in the hospital real estate sector. Wu (2015) developed a maturity model that supports decision making to improve university real estate management. However, the studies focused either on a different sector – hospital real estate sector or corporate real estate sector – or focused on different characteristics of the university real estate management process – the maturity level of university real estate management. To conclude, there is a gap in literature concerning the influence of organisational structure on the university real estate management process. Subsequently, this study aims to contribute to the body of knowledge by exploring this gap in literature. As such, existing CREM theory and organisational management theory is used to create a toolbox that can be used to support the university real estate sector.

1.2 PROBLEM STATEMENT

University real estate organisations are heavily influenced by the context in which they operate. Within this dynamic context, real estate organisations choose a particular organisational structure. Changes in organisational context can imply a reconsideration of the organisational structure of the real estate department. As a consequence, university real estate organisations seek to attain the organisational structure that is most beneficial for both their organisation and the management of their real estate. The corporate real estate management process is based on matching real estate with organisational objectives and adding value to organisational performance (den Heijer, 2011; de Vries, 2007; Dewulf et al., 2000; Krumm et al., 2000). Previous studies have therefore focused on aligning CREM with the core business of an organisation. However, many studies do not focus on the impact of the organisation on the real estate management process. As a consequence, university real estate organisations lack the information and tools to assess whether their organisation optimally supports the real estate management process. As the university real estate management process has become more complex, and financial resources have become rather limited in the last two decades (den Heijer, 2011), the question of which organisational structure optimally support the management of university real estate is of high relevance. This urges the need for new information and tools to assess the relation between organisational structure and corporate real estate management.

1.3 RESEARCH GOALS AND RESEARCH QUESTIONS

The research aims to provide a better understanding of the relationship between organisational structure and university real estate management. The goal of the research is to contribute to the body of knowledge concerning the organisational management and corporate real estate management. The research combines three fields of research:

1. the context of university real estate management;
2. the management of university real estate;
3. the organisational structure of university real estate departments.

The research objective is to provide university real estate organisations with a toolbox consisting of information and tools to support them in making decisions about the structuring of their organisation and the management of their real estate. The toolbox consists of three tools: (1) an analytical tool that determines the organisational structure of a university real estate organisation, (2) a model that assesses the university real estate management process, and (3) a model that determines which organisational structure is preferred based on specific conditions and in a specific context.

The problem statement and the research goals lead to the following main research question and sub-questions:

How does the organisational structure of the university real estate department influence the way university real estate is managed?

1. *What information about the context of university real estate organisations is relevant for managing university real estate?*
2. *What theories apply to university real estate management and organisational management?*
3. *What information and tools are currently available to assess the relation between organisational structure and university real estate management?*
4. *How is the concept of assessing the relation between organisational structure and university real estate management perceived and used by Dutch university real estate departments?*
5. *How can the currently available information and tools be used to assess and improve the relation between organisational structure and university real estate management?*

1.4 RESEARCH METHODOLOGY

1.4.1 RESEARCH APPROACH

The research builds upon the understanding of the relation between organisational structure and university real estate management. The explorative nature of this aim led to choosing a *case study approach* as methodology. Case study research is "an empirical inquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2003, p. 13). Case study research can have either a single case or multiple cases (Bryman, 2016). The research of a single case study is used to provide a detailed and intensive analysis of a single case, and is concerned with revealing the unique features of that case (Bryman, 2016). The research of multiple case studies is used in framing a general understanding of specific theory by presenting a number of cases (Bryman, 2016). Multiple case study research enables the researcher to examine the operation of generative causal mechanisms in contrasting or similar contexts (Bryman, 2016). Both single and multiple case studies first present detailed descriptions of the cases and then provide a cross-case analysis (Bryman, 2016). This study uses multiple cases to increase the reliability of the empirical evidence.

Case study methodology is a form of *qualitative research*; it enables the research to create an understanding of complex issues. Qualitative research tends to be concerned with words rather than numbers in the collection and analysis of data (Bryman, 2016, p. 375). Qualitative research emphasizes an inductive approach to the relationship between theory and research, in which the emphasis is placed on the generation of theories (Bryman, 2016).

1.4.2 RESEARCH DESIGN

Figure 1.1 illustrates the research design. The influence of the organisational structure of the university real estate organisation on university real estate management is studied in three parts.

The first part (1) introduces the research topic, describes the context of Dutch universities, and provides an overview of all relevant literature. The introduction includes the problem statement, research questions and research methodology. The

relationship between organisational structure and university real estate management is placed within the context of Dutch research universities. Therefore, the first part includes a description of the context in which university real estate managers make decisions regarding the organisational structure of their department and their real estate portfolio. In the past two decades much has been written about university real estate management and organisation theory. Therefore, a review of all relevant literature is also included. The first part concludes with an analytical framework that summarises all relevant literature, and is used for the case study research in the second part.

In the second part (2), the findings of the literature study and the empirical research are used in case studies of four different Dutch universities: Delft University of Technology, Wageningen University & Research, Utrecht University, and University of Twente. The case studies include a detailed analysis of the organisational structure of the real estate department and the university real estate management process. The detailed analysis of the organisational structure of the real estate department is provided in the appendices, as the main focus is on the university real estate management process. Before presenting the results of the case studies, the analysis of the organisational structure is summarised and compared to general practice. Following the four case descriptions, a cross-case analysis is provided.

The third part (3) presents the toolbox, summarises the answers to all research questions and presents a final conclusion. The third part also discusses the limitations of the research and provides recommendations for future research. The third part concludes the study by reflecting on the graduation research.

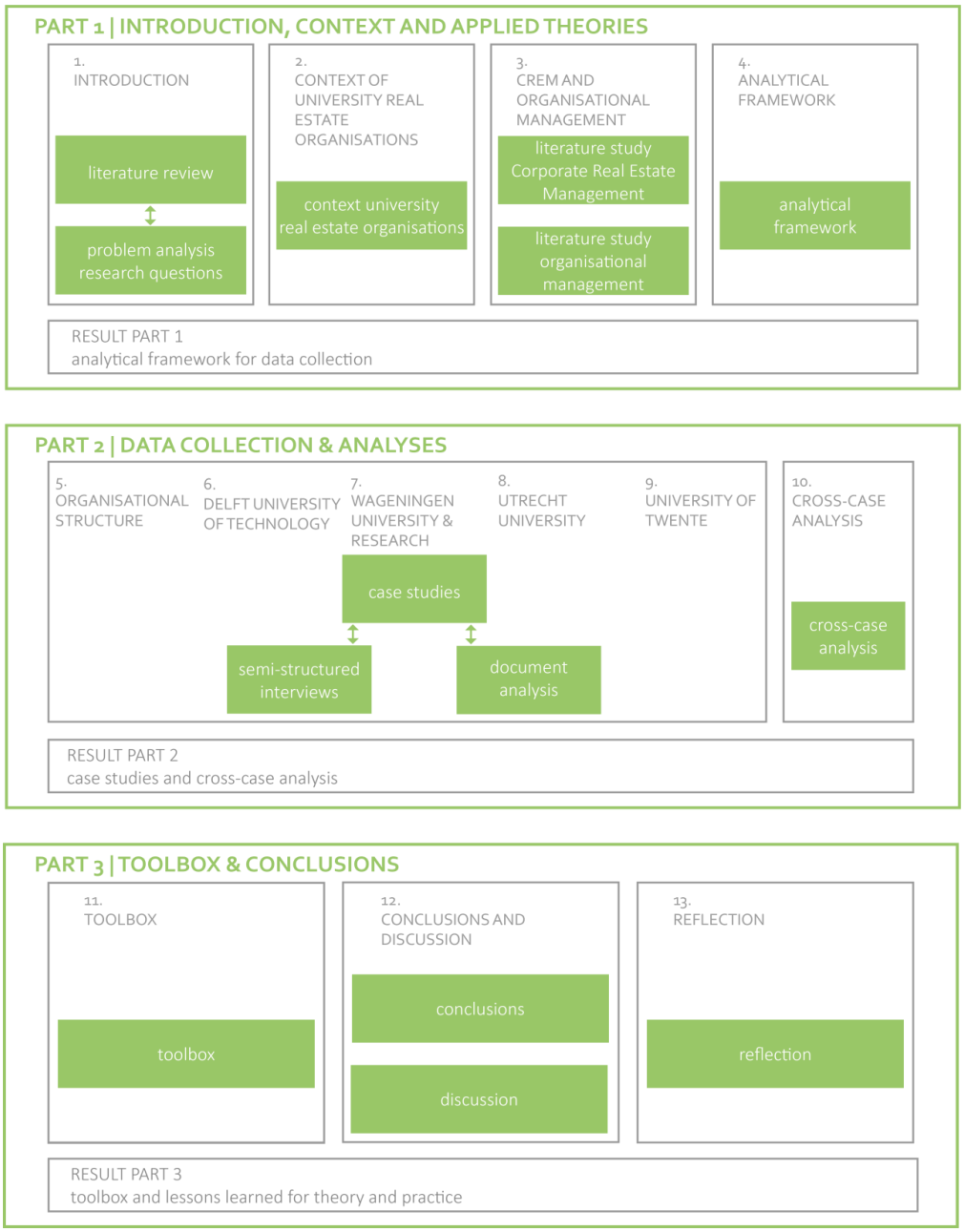


Figure 1.1 – Research design (own illustration)

CASE SELECTION

The case studies are selected based on the following selection criteria:

- *Variation in student numbers*
  Student numbers are used as an indicator for the size of a university. The Dutch universities vary in size, with enrolments from 10.000 to more than 34.000 students (VSNU, 2018). Universities of different sizes differ in organisational structure, and have different needs for their real estate. Therefore, using universities of different sizes creates a more general view of all Dutch universities and their real estate portfolio.

- *Variation in range of disciplines*
  The Dutch universities provide a range of disciplines, and every university is specialised in a particular discipline. Different disciplines require different types of real estate. For example, a university of technology requires laboratories, while universities specialised in social sciences or arts do not. Accordingly, using universities specialised in different disciplines creates a more general view of all Dutch universities and their real estate portfolio.

- *Variation in size of real estate portfolio*
  The Dutch universities own around 4,5 million square meters gross floor area and more than 1200 hectares of land property (den Heijer, 2011). Real estate portfolios of different sizes require different things. Thus, using universities with different sizes real estate portfolios creates a more general view of the Dutch universities and their real estate portfolio.

Although the differences of the universities increases the complexity of the case study analysis, it helps to form a more comprehensive and general picture of the relationship between organisational structure and university real estate management. Based on the data of previous research on university real estate (den Heijer, 2011; den Heijer et al., 2016), four cases were found that matched the formulated selection criteria (see Table 1.1 and Figure 1.2):

- *Delft University of Technology (TU Delft)*
- *Utrecht University (UU)*
- *Wageningen University & Research (WUR)*
- *University of Twente (UT)*

	Student numbers	Range of disciplines	Size of real estate portfolio
Delft University of Technology	24.500	Technical sciences	600.000
Wageningen University & Research	11.940	Agricultural sciences	248.412
Utrecht University	31.800	Arts Social sciences Medical sciences Theoretical sciences	655.000
University of Twente	10.660	Technical sciences	300.000

Table 1.1 – List of selected cases

Figure 1.2 – Overview Dutch research universities – selected cases (own ill. based on Algemene Rekenkamer, 2016)

1.4.3 DATA COLLECTION

A combination of different research strategies are used to collect data: literature study, document analysis and empirical research. In the literature study, the theoretical background is discussed and the context of university real estate organisations is presented. The literature study is used as a solid theoretical framework for the study. The literature study and the document analyses are used as input for the empirical research.

Literature study

As stated by Bryman (2016), studying existing literature is a crucial part of conducting research, since it establishes what is already known about a certain topic, and it acts as a background and justification for the research. The literature study provides theoretical background, which gives a better understanding of the different research subjects to be able to answer the research questions. The literature study also forms the basis for an analytical framework, which is used for studying the different cases.

The literature study focuses on the existing literature on corporate real estate management and organisational structure. The topics that are addressed in the literature study are: Corporate Real Estate Management theories, organisational management theories, context of Dutch university real estate organisations, sourcing, centralisation and concentration. The literature is found in scientific and academic articles, and books. The scientific articles are found by using search engines like Scopus and Google Scholar and various other internet sources. Most books are retrieved from the Delft Central Library and the BK library, both part of the Delft University of Technology.

Document analysis

The literature study and the empirical research are supported by the document analysis. The document analysis supports the literature study by providing information about the context of Dutch university organisations. The document analysis also provides detailed information about the four Dutch universities, which supports the empirical research. The document analysis uses reports on the Dutch education system and reports of the four interviewed universities. The information is found in publicly available publications and documents of the Dutch government and the four Dutch universities, such as annual plans and strategic plans.

Empirical research

Since the study uses a qualitative research method, the research also entails conducting semi-structured interviews. Semi-structured interviews, as described by Bryman (2016), are of flexible nature and respond to the direction in which interviewees take the interview. Because of this flexibility, this type of research provides insights into what the interviewees see as relevant and important, and it helps finding interrelations of different concepts (Bryman, 2016). Initially, the semi-

structured interviews were conducted with employees of the real estate departments of the four universities. The interviews with the real estate department are conducted with employees of different functions within the real estate organisation. The interviews with the employees of the real estate departments provide useful insight information on the organisational structure of the real estate department and the university real estate management process. However, after the first interviews it became clear that an additional interview was necessary to gather information from outside the real estate department to give a more realistic view on the university real estate management process. A last interview was thus conducted with an employee of the university organisation of TU Delft. **Table 1.2** provides an overview of all conducted interviews and the data of the interviews.

	University / Real Estate Department	Date of interview
Delft University of Technology	Real estate department University	February 25, 2019 April 29, 2019 May 15, 2019 July 11, 2019
Wageningen University & Research	Real estate department	March 22, 2019
Utrecht University	Real estate department	April 5, 2019
University of Twente	Real estate department	May 1, 2019

Table 1.2 – Interviews (own table)

1.4.4 DATA ANALYSIS

The collection and analysis of data occurs in several continuous parts: a literature study, a case study analysis and a cross-case analysis.

Part 1: Literature study

The first part consists of the literature study and forms the basis for the analytical framework. The existing literature on Corporate Real Estate Management and organisational management is analysed by means of a literature review.

Part 2: Case study analysis

The data obtained from the literature study are tested in the case studies. The data for the case studies are collected by a document analysis and semi-structured interviews. The data obtained from the interviews are collected and coded in ATLAS.ti, which is a software program designed for the qualitative analysis of large bodies of textual data. The data obtained is analysed by means of the analytical framework designed in the first part.

Part 3: Cross-case analysis

The third part consists of the cross-case analysis. The data collected from the case studies is compared based on the analytical framework. Comparing the four cases to each other helps finding similarities and differences between the different universities.

1.4.5 ETHICAL CONSIDERATIONS

When considering the ethical aspects of the chosen research subject and research methodology, a note has to be made about the protection of the privacy of individuals. To counter the risk of individuals being personally assessed on the statements they make during the interviews, the decision is made to anonymise the interviews and not publish the names, nor profession of the interviewees in the research. However, not making this information available affects the accountability of the research: the reader cannot verify whether the obtained data originates from a trustworthy source.

1.5 RESEARCH OUTPUT

1.5.1 DELIVERABLES

The research objective is to provide university real estate organisations with a toolbox consisting of information and tools to support them in making decisions about the structuring of their organisation and the management of their real estate. The information and tools are aimed to identify the influence of organisational structure on university real estate management. As such, the disciplines of Corporate Real Estate Management and organisational management are combined to gather new insights. The graduation report presents results and conclusions on how organisational structure influences university real estate management, and thereby provides the needed information and tools, which can be useful for university real estate departments.

1.5.2 DISSEMMINATION AND AUDIENCE

The study will be published in the Education Repository of Delft University of Technology; where it will be publicly available to everyone. The research is useful for both theory and practice: it is aimed at both professional researchers and university real estate departments.

The objective of the research is to fill a theoretical gap of knowledge in the disciplines of corporate real estate management and organisation theory, and to bring these two disciplines together. The research objective reflects the relevance the study for professional research. The thesis can form the basis for further research and a reference work for relevant literature and research to this topic.

Furthermore, the research aims to fill a practical gap of knowledge for real estate management in the university sector. The study provides insights into organisational structure and university real estate management. This could help universities and university real estate organisations make better decisions regarding the structure of their organisation and their real estate portfolio, and to make sure this structure supports the management of university real estate.

1.6 REPORT STRUCTURE

PART 1 describes the context of university real estate and the theoretical framework applied in this research. People who are unfamiliar with the Dutch higher education system can find background information in Chapter 2 on changes in regulation before and after 1995 and the impact on university real estate. This chapter also presents facts and figures on Dutch universities and their real estate. Chapter 3 gives an overview of all relevant literature related to university real estate management and organisational management. Chapter 4 results in an analytical framework of the relationship between University Real Estate Management and organisational structure.

In PART 2, the analytical framework established in PART 1 is applied to four Dutch universities. The results of the four case studies are described in Chapters 5 through 9. These five chapters include the empirical results of the semi-structured interviews and document analysis. Chapter 5 provides a summary of the case study analysis of the organisational structure of the four university real estate departments, and compares the findings to general practice. The detailed analysis of the organisational structure can be found in Appendices I to IV. Chapters 5 to 9 present the results of the case studies. The results of the case studies are cross analysed in Chapter 10.

PART 3 concludes the study by presenting the toolbox and summarising the answers to all research questions and formulating a main conclusion. Chapter 11 presents the toolbox . Chapter 12 I. In this chapter, the limitations of the research are also discussed and recommendations for future research are made. Chapter 13 presents a final reflection on the graduation project.

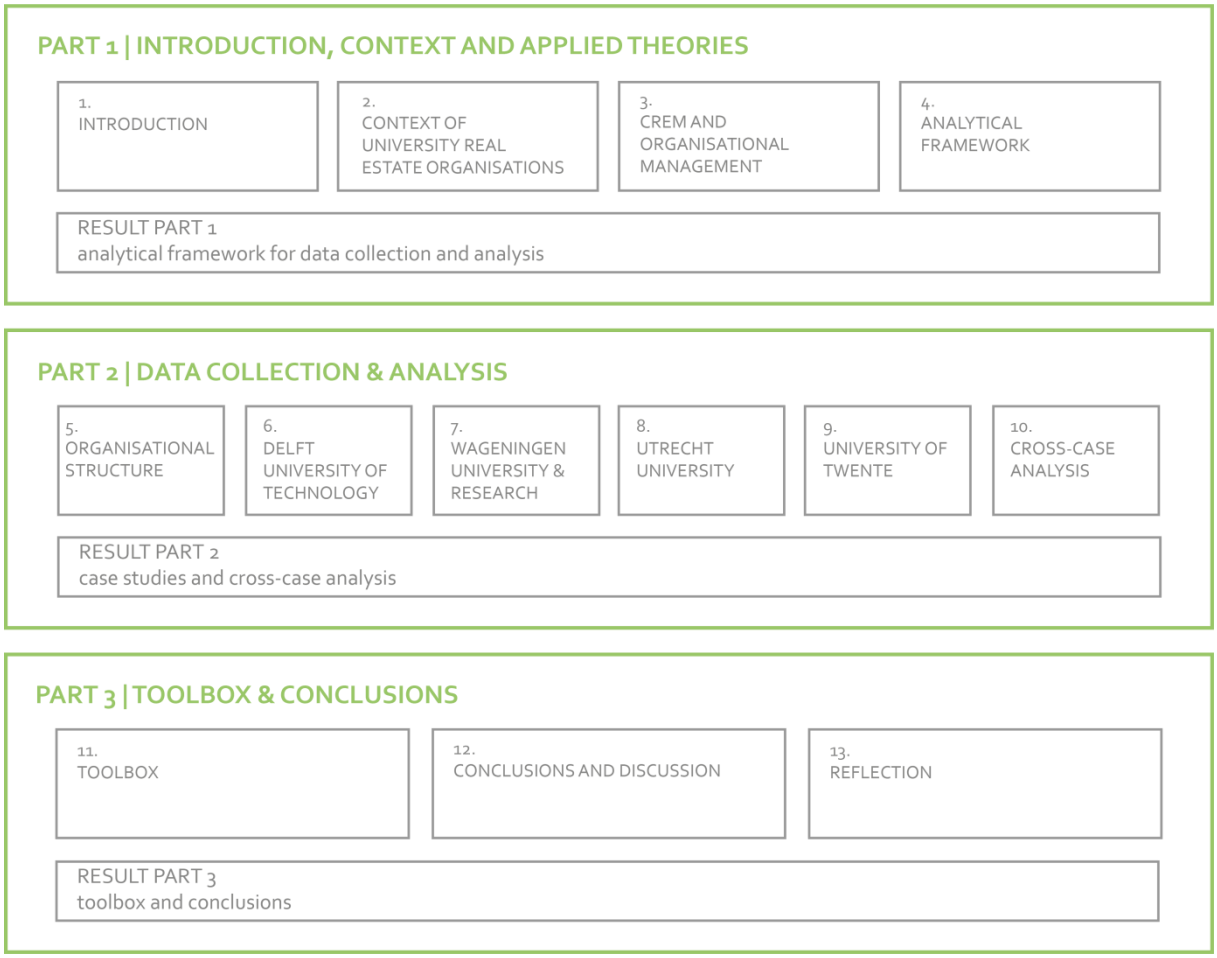
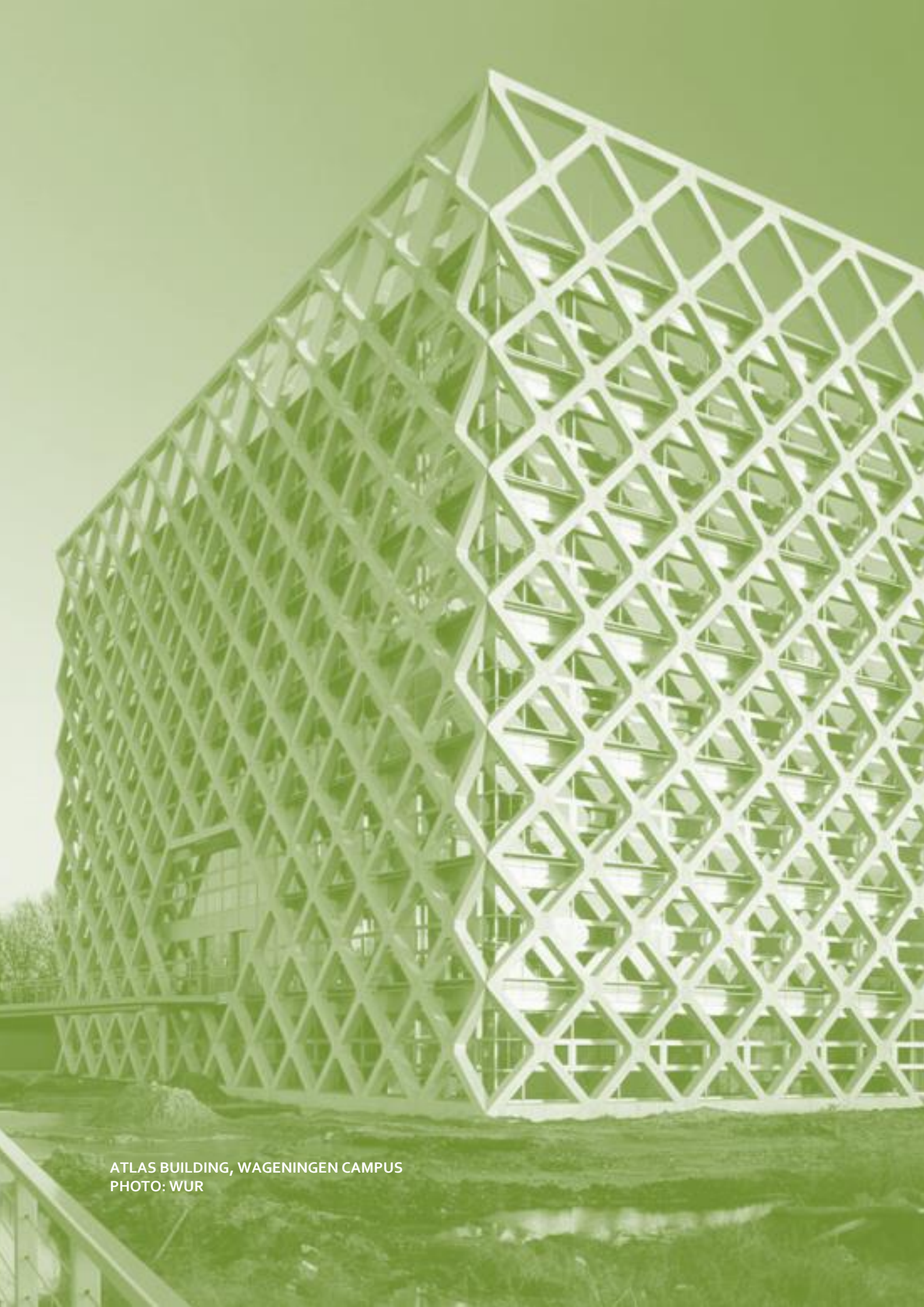


Figure 1.3 – Report structure (own illustration)



ATLAS BUILDING, WAGENINGEN CAMPUS
PHOTO: WUR

CHAPTER 2 – CONTEXT OF UNIVERSITY REAL ESTATE ORGANISATIONS

2.1 THE DUTCH EDUCATION SYSTEM

Dutch Constitution states that the government is responsible for education in the Netherlands. The government has a responsibility to create the right circumstances for the provision of education, which implies ensuring that primary education is provided in a sufficient number of public-authority schools in every municipality, providing funding for both privately and publicly run schools, and ensuring good quality of education. Figure 2.1 shows the Dutch education system.

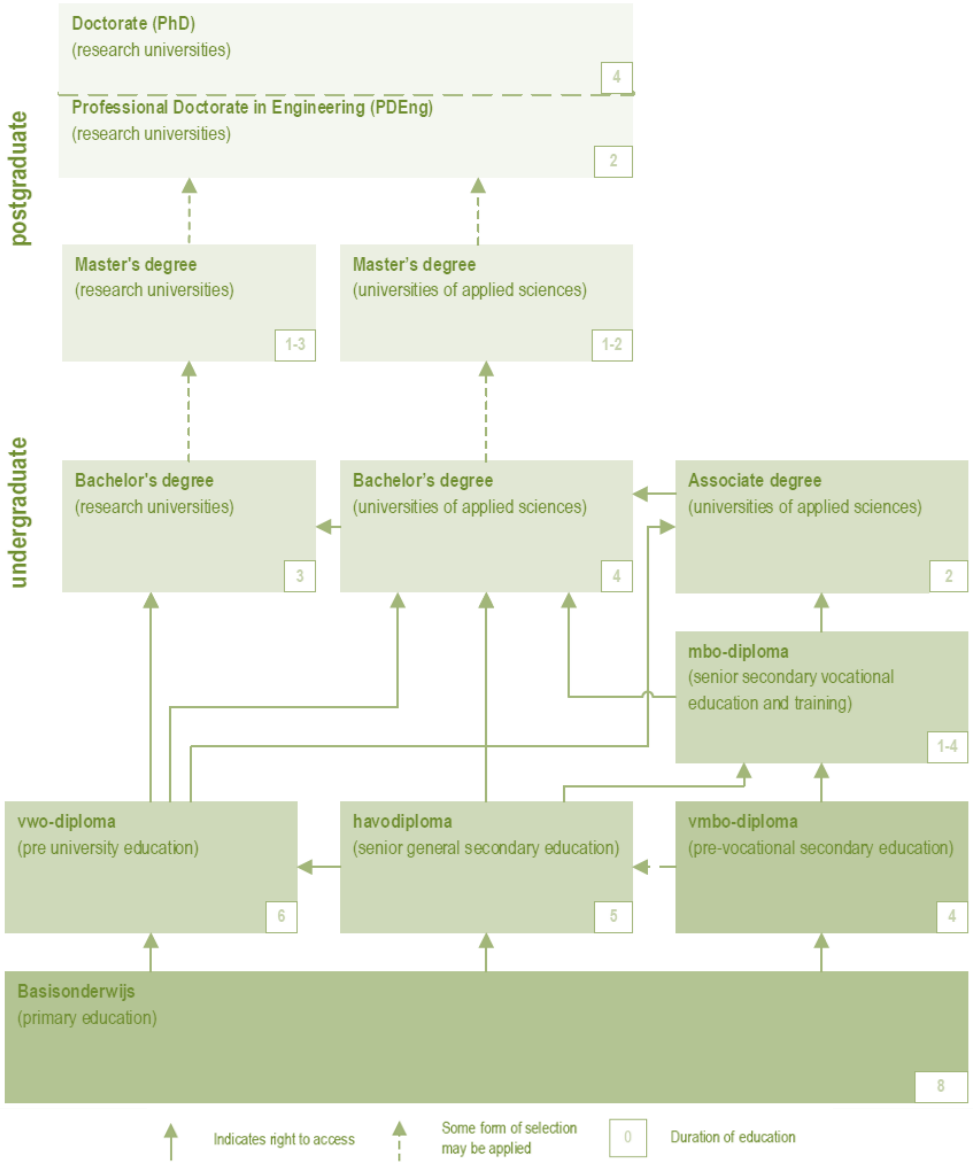


Figure 2.1 – The Dutch education system from primary to higher education (Nuffic, 2018a)

2.1.1 THE DUTCH HIGHER EDUCATION SYSTEM

The Dutch higher education system is a binary system that distinguishes between research-oriented higher education and higher professional education (Nuffic, 2018a). Research-oriented higher education is provided by research universities, and higher professional education is provided by universities of applied sciences (Nuffic, 2018a). There are three types of research universities and universities of applied sciences in the Netherlands (Nuffic, 2018a):

- Government-funded higher education institutions
  13 research universities, the Open University and 36 universities of applied sciences
  Government-funded higher education institutions are funded by the Ministry of Education, Culture and Science, and are entitled to issue legally recognised degrees (Nuffic, 2018a). These institutions offer study programmes for the statutory tuition fee (Nuffic, 2018a).
- Approved institutions
  Approved institutions do not receive funding from the Dutch government but may also issue legally recognised bachelor's and master's degrees (Nuffic, 2018a). These institutions are not bound by statutory tuition fees, and are free to determine their own tuition fees (Nuffic, 2018a).
- Private institutions
  Private institutions are not bound by Dutch government regulations (Nuffic, 2018a). However, these institutions may apply for accreditation by the Accreditation Organisation of the Netherlands and Flanders (NVAO) (Nuffic, 2018a).

The Dutch higher education system is organised around a three-cycle degree system, consisting of bachelor's, master's and PhD degrees (Nuffic, 2018b). The type of higher education determines the number of years and the number of ECTS credits required to complete the degree and the degree which is awarded (Nuffic, 2018a).

2.1.2 UNIVERSITY REAL ESTATE REGULATION UP TO 1995

Up to 1995 university land and buildings were government property (Arkesteijn & de Jonge, 2012; den Heijer, 2011). The Dutch government decided whether new investments in real estate could be made, and the universities were responsible for the maintenance of the real estate (Arkesteijn & de Jonge, 2012). The budget was divided between the universities on the basis of prioritisation, which created a competitive environment. Projects were judged on necessity and were assessed using standards for space use and investment levels (den Heijer, 2011, p. 71).

The period between 1960 and 1975 was an important period that shaped the current university real estate portfolio (Arkesteijn & de Jonge, 2012; den Heijer, 2011). In this period the government increased its spending on education and research, which caused the Dutch university real estate portfolio to grow enormously and led to building new campuses on the edges of cities (den Heijer, 2011). Since the government had financial responsibility of the real estate, and the universities were only responsible for maintaining the real estate, the budgeting system did only have a maintenance component (den Heijer, 2011). A disadvantage of this system was that it gave no incentive for efficient use of space: less floor area just meant fewer resources (den Heijer, 2011, p. 71).

In the period from 1988 till 1993, the government developed new models to promote efficiency in space use. Two examples of these models are 'WORM' (*Dutch: Wetenschappelijk Onderwijs Ruimtebehoefte Model*) and 'HOBEK' (*Dutch: Hoger Onderwijs Bekostiging*). In 1988 WORM was introduced to create standards in space use. WORM was a space demand model for universities and contained space standards and student-staff ratios for different types of faculties (den Heijer, 2011, p. 71). WORM used the student numbers as input, and space demand as output. With the introduction of HOBEK in 1993, the budgeting system became based on output. This shifted the attention from accommodating the university population to supporting the performance of the university (den Heijer, 2011, p. 71).

2.1.3 DECENTRALISATION UNIVERSITY REAL ESTATE SINCE 1995

In 1995 the Dutch government transferred the responsibility and ownership of the university real estate portfolio to the universities, which is also known as the 'IVH' operation (*Dutch: Integrale Verantwoording Huisvesting*) (Akersteijn & de Jonge, 2012; den Heijer, 2011). From that moment on universities were responsible for both maintaining the existing campus and investing in new construction project (den Heijer, 2011). Before the decentralisation, universities had to compete for public resources to finance new construction projects; the Dutch government judged the projects on necessity and assessed the projects using standards for space use and investment level (den Heijer, 2011).

The reason for decentralising the university real estate portfolio was to encourage universities to make more conscious decisions about investments and operating costs of their real estate (Arkesteijn & de Jonge, 2012). By placing the responsibility and accountability of the real estate portfolio with the universities, universities were forced to be more efficient with their finances and use of space (Arkesteijn & de Jonge, 2012). An indirect reason for the decentralisation, also mentioned by Arkesteijn & de Jonge (2012), is that universities wanted to use real estate as a means to profile themselves,

in addition to education and research. The timing of the transfer was advantageous for the Dutch government; at that time a period started in which the buildings of the 60s and 70s needed reinvestments (den Heijer, 2011). By decentralising the university real estate portfolio, the Dutch government also transferred the responsibility of the necessary reinvestments (den Heijer, 2011).

The decentralisation had some major consequences for all universities. After the transfer it became clear that the universities were not equipped for their new responsibility; the universities did not have enough knowledge nor resources (Arkesteijn & de Jonge, 2012; den Heijer, 2011; den Heijer et al., 2016). The universities struggled with the age of the university buildings and the necessary reinvestments (Arkesteijn & de Jonge, 2016; den Heijer, 2011). At the time of the transfer there was already a gap between the needed resources and the resources received from the government (den Heijer, 2011). Nevertheless, the universities did not receive additional funding apart from an incidental financial injections of 40 million euros (Arkesteijn & de Jonge, 2012; den Heijer, 2011). These 40 million was for all universities to cover the costs of the most urgent projects (Arkesteijn & de Jonge, 2012; den Heijer, 2011).

As a consequence gap between needed resources and received resources, necessary investments for the campus are financed with resources for education and research (den Heijer, 2011). An advantage of this system is that universities are forced to thoroughly evaluate every real estate project, and weigh the benefits against investments in education and research (den Heijer, 2011). The system could encourage efficient use of space to get extra financial resources, or it could endanger the primary process if the bad condition of buildings starts to influence the performance of the university. In addition to the new system, government funding has also decreased in the last two decades (Arkesteijn & de Jonge, 2012; den Heijer, 2011). The deficit in financial resources keeps increasing, as student numbers keep rising, the replacement costs are higher and the depreciation periods of investments are shorter (den Heijer, 2011).

2.1.4 FUNDING OF RESEARCH UNIVERSITIES

The Dutch government funds 18 research universities (OCW, 2014). The budget is divided into four components: a teaching component, a research component, performance funding, and a component for medical education and research (OCW, 2014). Tuition fees form an additional source of income for the universities (den Heijer, 2011; VSNU, n.d.). The tuition fees are paid by students; students pay an amount in fees if education programme does not receive government funding (VSNU, n.d.) University funding makes a distinctions between funds for teaching and funds for research (den Heijer, 2011). Figure 2.2 shows the funding system of Dutch universities. University research is funded from thee different sources (Algemene Rekenkamer, 2016; OCW, 2014; VSNU, n.d.):

- First flow of funds – direct government funding
  Universities receive a financial contribution from the Dutch central government in order to perform their statutory obligations in the field of education, research and knowledge valorisation (VSNU, n.d.). The financial contribution is the government grant from the Ministry of Education, Culture and Science (Algemene Rekenkamer, 2016).

- Second flow of funds – indirect government funding
  Universities receive research grants from the Netherlands Organisation for Scientific Research (NOW) and the Royal Netherlands Academy of Arts and Sciences (KNAW) (Algemene Rekenkamer, 2016; VSNU, n.d.)

- Third flow of funds – contract research funding
  The third flow of funding encompasses the universities' other revenues, e.g. from education contracts and research contracts, and grants from Dutch ministries and the European Union (VSNU, n.d.). The third flow of funds is generated by research commissioned by international and national government bodies and non-profit institutions (OCW, 2014).

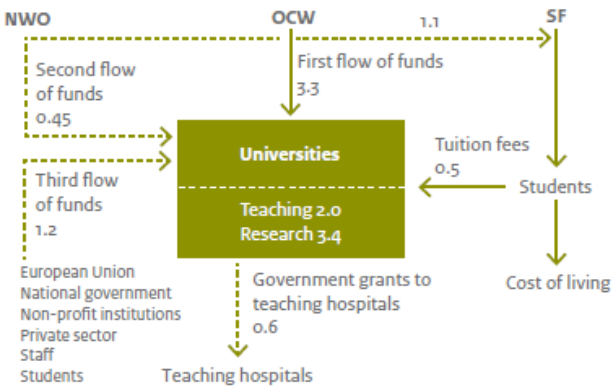


Figure 2.2 – Funding of Dutch research universities – amounts for 2012 *(x € 1 million)* (OCW, 2014, p. 92)

2.2 DUTCH UNIVERSITIES – FACTS AND FIGURES

The Dutch higher education system consists of eighteen publicly funded research universities. **Figure 2.3** shows the locations of all eighteen universities in the Netherlands. Central to this study are four universities, which are selected case studies; Delft University of Technology, Wageningen University & Research, Utrecht University and University of Twente. However, this chapter provides general context information of thirteen Dutch universities. The other five differ in terms of size and financial structure, and therefore are left out. The thirteen universities focus on education as well as research, ensuring that every student is instructed in a research-intensive environment. They accommodate more than 290.000 students (2018) and about 54.000 employees (2018), of which more than 31.000 are academic staff (VSNU, 2018).

The Netherlands has three types of universities: broad universities, universities of technology and agricultural universities (den Heijer, 2011). Nine of the thirteen universities are considered broad universities; they teach and carry out research in a broad range of disciplines spanning seven sectors: Economics, Health, Behaviour and Society, Science, Law, Engineering and Technology, and Language and Culture (den Heijer, 2011). Three universities focus predominantly on engineering and technology – the technical universities in Delft, Eindhoven and Enschede. Wageningen University & Research provides courses and generates knowledge in the field of life sciences and natural resources and is the only university that is financed by the Ministry of Agriculture, Nature and Food Quality (OCW, 2014). All other universities are financed by the Ministry of Education, Culture and Science (OCW, 2014). Table 2.4 provides a more detailed overview of the university profiles of the Dutch universities.

gamma	gamma-beta	alpha-beta-gamma	beta	beta
social sciences	**social sciences** **sciences** • **theoretical** • **medical**	**arts** **social sciences** **sciences** • **theoretical** • **medical**	**sciences** • **technical**	**sciences** • **agricultural**
UvT - Tilburg	**EUR** - Rotterdam	**LEI** - Leiden	**TUD** - Delft	**WUR** -
	UM - Maastricht	**RU** - Nijmegen	**TUE** - Eindhoven	Wageningen
		RUG - Groningen	**UT** - Enschede	
		UU - Utrecht		
		UvA - Amsterdam		
		VU - Amsterdam		

Table 2.1 – Categories of university profiles – universities categorised by their dominant profile(s) (den Heijer, 2011) edited

The universities vary in size, with student enrolments ranging from 10.660 (University of Twente) to 34.060 (University of Amsterdam), see Table 2.2. The average Dutch university has more than 20.000 students and 4.200 staff members. In the last few years, the student numbers have increased significantly. In 2007, the smallest university had only 4.700 students (Wageningen University & Research), and the largest university 29.2000 (Utrecht University) (den Heijer, 2011, p.58). The average Dutch university in 2007 had around 16.000 students and 3.500 staff members. Currently, about 59% of all staff is academic staff and the ratio of students to academic staff is 11. There is quite a range in the ratio of students to academic staff member: 6 students per FTE (fulltime equivalent) in Eindhoven and 21 students per FTE in Rotterdam.

Figure 2.3 – Dutch universities, names, locations and used abbreviations (den Heijer, 2011) edited

#	University Name	Abbreviation
1	Delft University of Technology	TUD
2	Utrecht University	UU
3	Wageningen University & Research	WUR
4	University of Twente	UT
5	Leiden University	LEI
6	Tilburg University	UvT
7	Maastricht University	UM
8	Vrije Universiteit Amsterdam	VU
9	University of Amsterdam	UvA
10	Eindhoven University of Technology	TUE
11	Erasmus University Rotterdam	EUR
12	Radboud University Nijmegen	RU
13	University of Groningen	RUG
14	Open University	-
15	Protestant Theological University	-
16	University of Humanistic Studies	-
17	Theological University Apeldoorn	-
18	Theological University Kampen	-

		Student enrolment	Staff (FTE) academic	Staff (FTE) supporting	Staff total FTE	Ratio part-time	students / acad-FTE	Staff (headcount) academic	Staff (headcount) supporting
TUD	Delft	24.500	3.060	2.080	5.140	89%	8	3.440	2.370
UU	Utrecht	31.800	3.140	2.430	5.570	85%	10	3.650	2.920
WU	Wageningen	11.940	1.540	980	2.520	88%	8	1.670	1.180
UT	Enschede	10.660	1.580	1.120	2.700	90%	7	1.710	1.300
LEI	Leiden	29.040	2.380	1.760	4.140	84%	12	2.750	2.150
UvT	Tilburg	15.730	970	680	1.650	82%	16	1.180	840
UM	Maastricht	17.190	2.090	1.500	3.590	84%	8	2.440	1.830
VU	Amsterdam	24.560	2.010	1.390	3.400	82%	12	2.520	1.650
UvA	Amsterdam	34.060	2.830	1.860	4.690	84%	12	3.380	2.210
TUE	Eindhoven	11.960	1.990	1.040	3.030	92%	6	2.110	1.200
EUR	Rotterdam	26.960	1.290	870	2.160	85%	21	1.530	1.020
RU	Nijmegen	21.670	1.710	1.510	3.220	83%	13	1.990	1.890
RUG	Groningen	31.150	2.290	1.830	4.120	85%	14	2.600	2.230
total		272.120	26.880	19.050	45.930	-	-	31.960	22.790
average		20.930	2.060	1.460	3530	86%	11	2.450	1.750

Table 2.2 – Student enrolment and staff at thirteen Dutch universities, academic year 2018/2019 (based on VSNU, 2018)

2.3 UNIVERSITY REAL ESTATE IN THE NETHERLANDS

2.3.1 QUANTITY OF UNIVERSITY REAL ESTATE

Table 2.3 provides detailed on the physical campus in m^2. At the end of 2015, the real estate portfolio of all universities comprised of approximately 4.4 million gross floor area (den Heijer et al., 2016). Figure 2.4 shows the size of the university real estate portfolio in 2006 and 2015. The figure illustrates that the size of the real estate portfolio has remained virtually unchanged in the last decade: from 4.438.763 GFA in 2006 to 4.400.627 GFA in 2015. As can be seen in Table 2.3, the floor area used by the universities ranges from 132.500 to 655.000 square meters. The universities own most of the properties: the maximum percentage of rented space is 11%, at the University of Amsterdam. Several universities do not even rent space at all. The percentages of rented space show that the Dutch universities prefer to own their real estate properties.

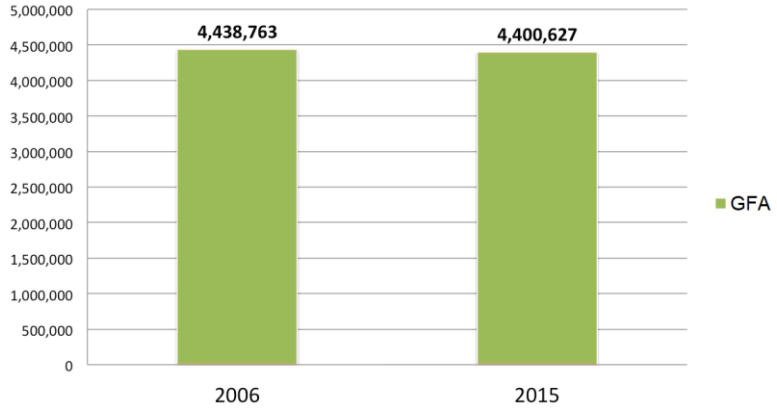


Figure 2.4 – Size of the Dutch university campus in m^2 (GFA) (den Heijer et al., 2016) edited

		floor area in m^2 gross	floor area in m^2 usable	% usable	ownership % owned	ownership % rented
TUD	Delft	544.000	314.000	58&	100%	
UU	Utrecht	655.000	-	-	95%	5%
WUR	Wageningen	248.400	-	-	100%	
UT	Enschede	300.000	-	-	98%	2%
LEI	Leiden	456.000	-	-	92%	8%
UvT	Tilburg	132.500	-	-	98%	2%
UM	Maastricht	213.800	-	-	91%	9%
VU	Amsterdam	320.000	173.000	54%	97%	3%
UvA	Amsterdam	406.000	252.000	62%	89%	11%
TUE	Eindhoven	337.000	226.000	67%	100%	
EUR	Rotterdam	171.000	103.000	60%	100%	
RU	Nijmegen	290.000	174.000	60%	100%	
RUG	Groningen	390.000	241.000	62%	93%	7%
total		4.463.700				
average		343.400				

Table 2.3 – Quantity of university real estate in the Netherlands (based on den Heijer, 2011 and Algemene Rekenkamer, 2018) *

** A note has to be made here about the age of the data provided in Table 2.3: the data is based on research of den Heijer (2011), which was collected in 2007, and on research of the Dutch government (Algemene Rekenkamer, 2016), which was collected in 2016. Thus, not all data is up-to-date.*

2.3.2 QUALITY OF UNIVERSITY REAL ESTATE

The technical condition of university real estate is assessed on the basis of the condition method NEN 2767 of the Dutch Standardisation Institute. With this condition method, buildings are assessed in six conditions: excellent, good, reasonable, moderate, bad and very bad. Table 2.4 shows the condition scores of university real estate in 2016 in m^2 and %. Figure 2.5 shows the technical condition of university real estate in 2006 and in 2015. As illustrated in Table 2.4 and Figure 2.5, almost 50% of all university real estate can be considered good or excellent, and 15% can be considered bad or very bad. Compared to 2006, considerably more university buildings meet the condition 'good' and 'excellent': from 36% in 2006 to 49% in 2015. As shown in Figure 2.5, most university real estate has improved since 2015: the percentage of the real estate portfolio with the condition scores reasonable, good and excellent has gone up, and the percentage of the real estate portfolio with the condition scores moderate, bad and very bad has gone down.

Condition	University real estate	%
1 excellent	917.000	21%
2 good	1.230.000	28%
3 reasonable	911.000	21%
4 moderate	667.000	15%
5 bad	538.000	12%
6 very bad	152.000	3%
	total 4.400.000	100%

Table 2.4 – Condition assessment university real estate, 2015 (den Heijer et al., 2016)

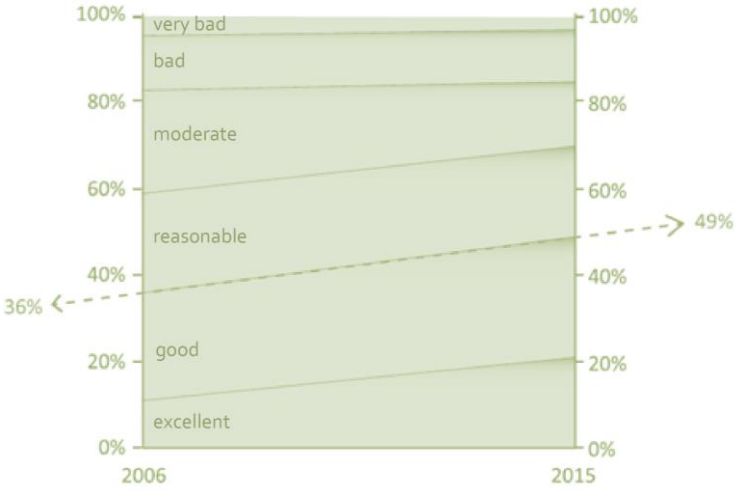


Figure 2.5 – Quality of university real estate in the Netherlands, 2005 and 2015 (Algemene Rekenkamer, 2018)

2.3.3 LOCATION AND AGE DISTRIBUTION OF UNIVERSITY REAL ESTATE

Many Dutch universities own land and buildings within and outside the city (den Heijer, 2011). Most universities historically located themselves in the city center (den Heijer, 2011). In the 50s and 60s, when student numbers strongly increased, the universities were forced to relocate their campus to the edge of the city (den Heijer et al., 2016). The relocation of university campuses is still visible in the current location of buildings and land property (den Heijer, 2011). Considering the transition from inner-city campuses to edge-of-the-city campuses, den Heijer (2011) distinguishes three different spatial configurations of the campus: campus outside the city, campus gated within the city and campus integrated with the city. Den Heijer (2011) also links the three configurations to a timeline that matches the age distribution of the Dutch university real estate portfolio, which is shown in Figure 2.6.

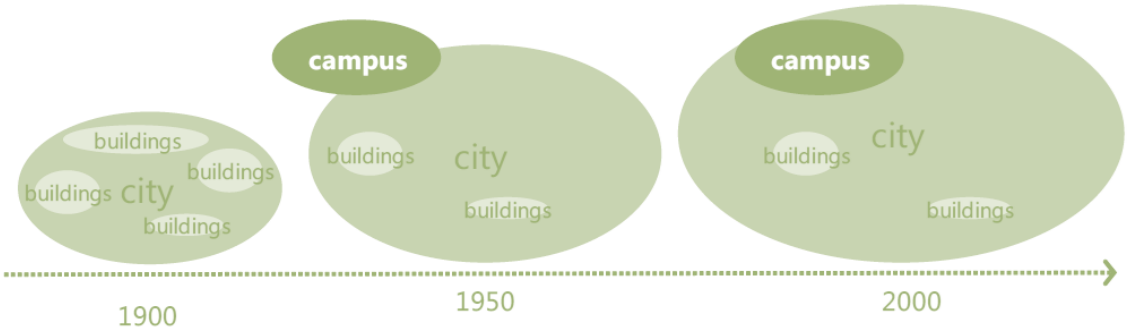


Figure 2.6 – The transition of the Dutch university campus from 1900 to now (den Heijer, 2011, p. 61)

TUD - Delft (TU South / Technopolis)
UT - Enschede
UU - Utrecht (de Uithof)

EUR - Rotterdam
LEI - Leiden (Leeuwenhoek)
RU - Nijmegen
RUG - Groningen (Zemike)
TUD - Delft (TU Center)
TUE - Eindhoven
UM - Maastricht (Randwyck)
UU - Utrecht (University College)
UvA - Amsterdam
UvT - Tilburg
VU - Amsterdam
WUR - Wageningen

LEI - Leiden (inner-city)
RUG - Groningen (inner-city)
TUD - Delft (TU North)
UM - Maastricht (inner-city)
UU - Utrecht (inner-city)
UvA - Amsterdam (Roeterseiland)

Figure 2.7 – The spatial configuration of all Dutch university campuses (den Heijer et al., 2016, p. 46)

old					young
< 1800		**1800 - 1950**		**> 1950**	
LEI - Leiden	1575	**TUD** - Delft	1842	**TUE** - Eindhoven	1956
RUG - Groningen	1614	**VU** - Amsterdam	1880	**UT** - Enschede	1961
UvA - Amsterdam	1632	**EUR** - Rotterdam	1913	**UM** - Maastricht	1976
UU - Utrecht	1636	**WUR** - Wageningen	1918		
		RU - Nijmegen	1923		
		UvT - Tilburg	1927		

Table 2.5 – Categories of university age (den Heijer, 2011)

The first configuration – *campus integrated with the city* – shows locations of university buildings that accommodate the elite institutions before and in the first decades after 1900 (den Heijer, 2011). The second configuration – *campus outside the city* – illustrates the transition to locations on the edge of the cities (den Heijer, 2011). Some universities left the inner-city location completely to intensify the use of the new campus on the edge of the city (den Heijer, 2011) The third configuration – *campus gated within the city* – represents the current university campus (den Heijer, 2011).

Figure 2.7 shows the distributions of all Dutch university campuses according to the three spatial configurations of den Heijer (2011). Table 2.5 shows the founding years of Dutch universities. As can be seen in Table 2.5, there is more than 400 years age difference between the oldest Dutch university (University Leiden, founded in 1575) and the youngest university (University of Maastricht, founded in 1976). Considering the founding years and the location distribution of the universities, den Heijer (2011) concludes there is a correlation between the two: the age of the universities explains which universities are most likely to have inner-city university buildings and which universities have large campuses on the edge of cities. All old universities (<1800) still have inner-city buildings, whereas the newer universities have left most of their inner-city locations. The only exception is the University of Maastricht, which is a young university located in the inner-city.

FACULTY OF ARCHITECTURE, TU DELFT CAMPUS
PHOTO: TU DELFT

CHAPTER 3 – CREM AND ORGANISATIONAL MANAGEMENT

3.1 THEORIES ON CORPORATE REAL ESTATE MANAGEMENT

Within the subject of real estate management various specialisations can be distinguished (De Jonge et al., 2009): portfolio management, Corporate Real Estate /management (CREM), and Public Real Estate Management (PREM). Portfolio management, also referred to as Real Estate Management (REM) by investors, mainly focuses on financial goals (De Jonge et al., 2009; den Heijer, 2011). Corporate real estate management is real estate management by private organisation or businesses which are both owners and occupiers of their real estate. CREM focuses on the performance of the organisation in relation to the resources that are spent on real estate. Public real estate management – also referred to as real estate management by public parties – also focuses on the performance in relation to the resources, but adds public goals to this. PREM, as stated by den Heijer (2011), "can be defined as a specific form of CREM, from the perspective of a public organisation and focussing not only on economic goals but also on societal and political goals" (p. 104).

According to den Heijer (2011), corporate real estate management theory is most applicable to university real estate management theory. Dewulf et al. (2000, p. 32) define corporate real estate management as follows:

> *"The management of a corporation's real estate portfolio by aligning the portfolio and services to the needs of the core businesses (processes), in order to obtain maximum added value for the business and to contribute optimally to the overall performance of the corporation."*

3.1.1 ADDED VALUE

Corporate real estate management is based on the proposition that real estate adds value to performance (den Heijer, 2011; de Vries, 2007; Dewulf et al., 2000; Krumm et al., 2000). "If real estate had no impact on performance, no society, organisation or individual would spend resources on it" (den Heijer, 2011, p. 91). As den Heijer (2011) states, managing the relationship between real estate and performance is important to create a positive added value or to avoid a negative influence on organisational goals (see Figure 3.1).

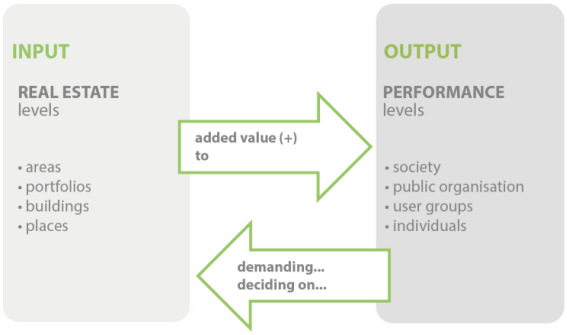


Figure 3.1 – The goal of REM: deciding on real estate in order to create a positive added value to performance (den Heijer, 2011) edited

The added value of real estate is defined as the contribution to organisational objectives and organisational performance (de Vries, 2007; den Heijer, 2011). Organisational performance is defined as the extent to which an organisation realises its objectives. According to de Vries (2007), organisational performance can be defined by productivity, profitability and competitive advantage. In her dissertation, den Heijer (2011) adds a fourth measurement: sustainable development.

In order to reach productivity, profitability, competitive advantage and sustainable development, organisations can use certain real estate strategies. Nourse and Roulac (1993) were the first to determine real estate strategies which organisation could use in order to support their overall performance. Their theory was embraced by many researchers (see de Jonge et al., 2009; Lindholm et al., 2006; de Vries, 2007), which used the theory of Nourse and Roulac (1993) as a base for their own lists of strategies in which real estate can add value to organisational performance. Based on all the real

estate strategies formulated by all these different researchers, den Heijer (2011) formulated ten ways of adding value, which are listed below:

1. Increasing real estate value;
2. Controlling risk;
3. Decreasing costs;
4. Increasing flexibility;
5. Supporting user activities;
6. Increasing (user) satisfaction;
7. Supporting image;
8. Supporting culture;
9. Stimulating collaboration;
10. Stimulating innovation.

In theory, every real estate decision can be related to at least one of these goals. However, in practice it is hard to find evidence that real estate decisions actually do add to profitability, productivity, competitive advantage and sustainable development (den Heijer, 2011).

3.1.2 LEVELS OF MANAGEMENT

Den Heijer & de Jonge (2004) identify three levels of management: strategic, tactical and operational. The three levels are widely used by researchers as an operational model for real estate management (see van Driel, 2010; Vermeulen & Wieman, 2010; Meerbeek, 2013).

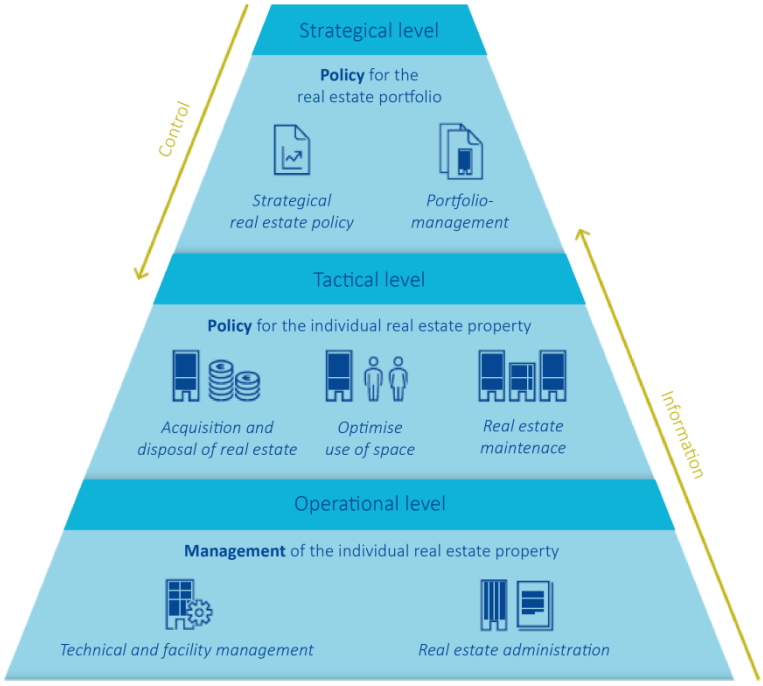


Figure 3.2 – Three levels of management (Algemene Rekenkamer, 2016)

At the strategic level, the organisation determines its strategic real estate policy and the entire real estate portfolio is managed (Algemene Rekenkamer, 2017; van Driel, 2003; Vermeulen & Wieman, 2010). According to van Driel (2003), the strategic level corresponds with portfolio management. At this level, the organisation formulates a strategic long-term plan for its real estate – also known as the real estate strategy – which links the objectives and goals of the organisation to the real estate demand, the real estate plans and the real estate investments (Algemene Rekenkamer, 2017). The real estate strategy must be regularly updated, due to the long-term perspective of real estate decisions (Algemene Rekenkamer, 2017).

Real estate management of individual real estate properties takes place at the tactical level (Algemene Rekenkamer, 2017; van Driel, 2003; Vermeulen & Wieman, 2010). According to van Driel (2003), the tactical level corresponds with asset management. At this level, the strategic plan is translated into an individual real estate policy (Vermeulen & Wieman, 2010). In this policy, real estate is aligned with user demands (Algemene Rekenkamer, 2016). The policy is based on performance analyses of the individual real estate property (Vermeulen & Wieman, 2010). Real estate decisions at this level include decisions about the acquisition and disposal of real estate, optimising use of space and maintaining the individual real estate properties (Algemene Rekenkamer, 2017).

The operational level is concerned with the management of the individual real estate properties (Algemene Rekenkamer, 2017; van Driel, 2003; Vermeulen & Wieman, 2010). According to van Driel (2003), the operational level corresponds with property management. At this level, the implementation of the individual real estate policy takes place (Vermeulen & Wieman, 2010), which includes the technical and facility management of the individual real estate property and the real estate administration (Algemene Rekenkamer, 2017).

3.1.3 THE ROLE OF CORPORATE REAL ESTATE MANAGEMENT

The role of corporate real estate management has changed over the years. Whereas in the past real estate was merely seen as 'a necessary cost to the organisation' (Evers, van der Schaaf & Dewulf, 2002), nowadays it is seen as a strategic tool, which can be used to add value to the primary process of the organisation (den Heijer, 2011). Real estate is now considered the fifth resource for organisations, which cannot be isolated from the other four: capital, human resources, information and technology (den Heijer, 2011; Dewulf et al., 2000; Joroff et al., 1993).

This changing role of real estate management is described by Joroff et al. (1993). Joroff et al. (1993) identified five stages of the development of the real estate department (see Figure 3.5). With each level, the real estate department to introduces new sources of added value (Joroff et al., 1993). Real estate decisions in the second, third and fourth stage are based on cost-quality considerations: real estate has to efficient (de Jonge et al., 2009). In the fifth stage it is not only necessary to be efficient, it also needs to be effective for the organisation as a whole (de Jonge et al., 2009). The model is additive by nature (Joroff et al., 1993). The existing operational basis is extended with more strategic issues linked to the results of the corporation (Dewulf et al., 2000, p. 31). The five evolutionary stages of real estate are as follows (Joroff et al., 1993; de Jonge et al., 2009; Den Heijer, 2011; Dewulf et al., 2000):

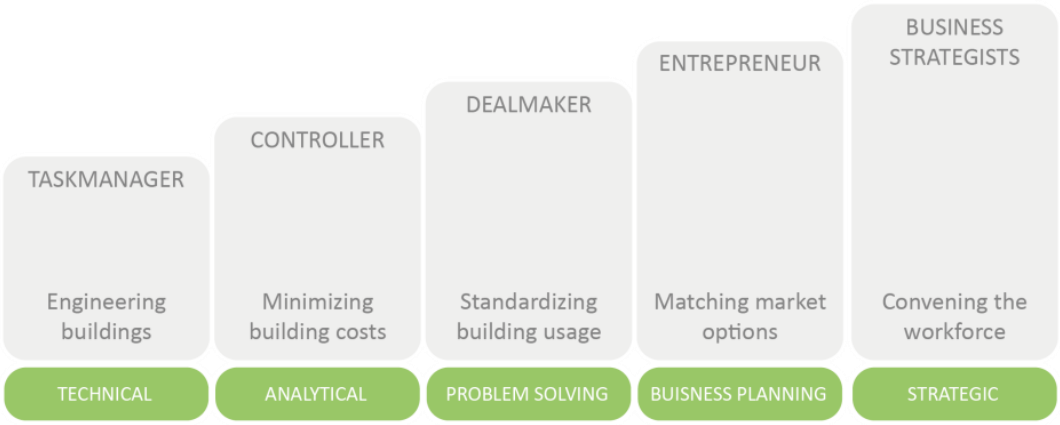


Figure 3.3 – Five evolutionary stages of real estate (Joroff et al., 1993) edited

Taskmaster
At this stage, real estate management only has a technical focus, and provides the organisation of physical space. Real estate is viewed as value-neutral: neither a cost nor a benefit. At this stage, strong technical abilities are needed to provide general services on real estate assets as needed.

Controller
The potential costs and benefits or real estate are recognized, but the focus is on minimising the costs. Senior management becomes more directive towards its real estate. The mission of a real estate department in this stage is to support the business unit's needs at the lowest costs possible. At this stage, strong analytic skills are necessary.

Dealmaker
The real estate unit's mission is to seize opportunities to create value, both financial and organisational. The real estate unit behaves more proactively and solves problems in a way that creates financial value for the organisation. The real estate unit tries to standardise building use. The mission of the real estate department is seizing opportunities to create value in company assets, both financial and organisational. The real estate department and the business units work together to identify the optimal space needs of the users, and looks critically to the real estate markets for information and brings project value and significant alternatives to the business units.

Intrapreneur
The real estate unit operates as a real estate company by competing to perform work for the organisation. The department tries to match the real estate unit's strategy to its competitors', also known as benchmarking. There are three main objectives: reduce costs, save money, and act as an independent business and profit center. At this stage, there is an

increasing need to coordinate with other internal support divisions, such as human resources, IT, sales, and marketing. The real estate department demonstrates the value of its participation with the business units through measurable results.

Business strategist
Value is added to the organisation as the real estate unit anticipates business trends by monitoring and measuring their impacts. The real estate department tries to contribute to the value of the organisation as a whole by focusing on the organisation's strategy, and is closely aligned with senior management. The mission of the department is providing real estate but also convening the workforce. At this stage, highly developed strategic competencies are necessary, such as strategic management.

3.1.4 THE TENSION FIELD OF CORPORATE REAL ESTATE MANAGEMENT

According to Dewulf, Krumm and de Jonge (2000) corporate real estate management deals in four fields of focus: 1) the business focus, 2) the real estate focus, 3) the strategic focus and 4) the operational focus. De Jonge (as cited in de Jonge et al., 2009, p.10) has positioned (corporate and public) real estate management in terms of a match between business (demand side) and real estate (supply side), connecting the strategic and operational level. Corporate real estate management and public real estate management concern the demand side of real estate (business focus), whereas real estate management focus on the supply side of real estate (real estate focus) (Dewulf, Krumm and de Jonge, 2000). From the four fields follow four different disciplines related to managing a corporate real estate portfolio: general management, asset management, facility management and cost control.

The CREM model of Dewulf, Krumm and de Jonge (2000) has changed over the years and has been redefined into a conceptual framework that identifies four types of stakeholders and their matching perspectives (den Heijer, 2011) (**figure 3.5**). "These domains represent disciplines that share the objective of optimally attuning corporate accommodation to organisational performance, adding value to corporate objectives" (de Jonge et al., 2009, p.10).

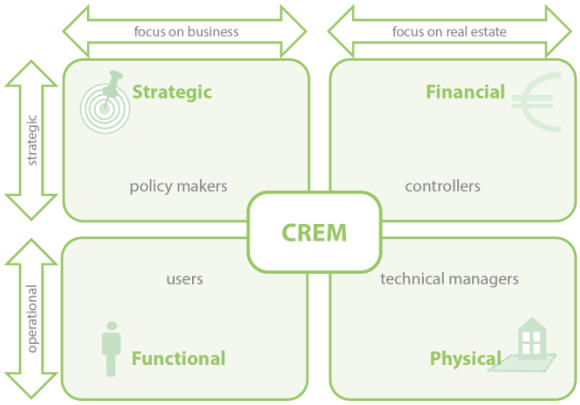


Figure 3.5 – Stakeholders are linked to the four perspectives on CREM (den Heijer, 2011) edited

The strategic perspective incorporates the direct contribution of real estate to overall organisational objectives; how and to what extend organisational objectives are supported, accomplished or hindered by the real estate portfolio (den Heijer, 2011; van der Zwart, 2014). The strategic perspective includes decisions that improve the quality and effectiveness of the primary process (van der Zwart, 2014).

The functional perspective represents the users of the real estate portfolio (den Heijer, 2011). The number and different types of users, the user satisfaction and occupancy and frequency rates are the most important aspects of this perspective. The objective of this view is keeping the users satisfied and providing accommodation that suits the users' demands, given the physical aspects and costs constraints (den Heijer, 2011; van der Zwart, 2014).

The financial perspective represents all resources that are spent on real estate (den Heijer, 2011; van der Zwart, 2014). The objective is managing the real estate assets to generate enough income to cover all expenses and ensuring to have financial means to cover future maintenance and uncertainties characterised as having little financial means at their disposal. According to den Heijer (2011), three aspects are related to the costs and benefits of real estate: the available budget, the real estate value and the costs of managing the real estate (p. 139).

The physical perspective represents the quantification and quality levels of the real estate portfolio (den Heijer, 2011). The objective is to match the physical portfolio with the real estate strategy in a way that is cost effective and meets the demand of the users.

3.2 THEORIES ON ORGANISATIONAL MANAGEMENT

Mintzberg (1979, p. 2) defines organisational structure as follows:

> *"The structure of an organisation can be defined simply as the sum total of the ways in which it divides its labour into distinct tasks and then achieves coordination among them".*

In his book, Mintzberg (1979) developed a typology of five distinctive organisations, which are the Simple Structure, the Machine Bureaucracy, the Professional Bureaucracy, the Divisionalised form and the Adhocracy. The foundation of this typology consists of the five coordinating mechanisms, the five basic parts of an organisation and the five systems of basic flows in the organisation. Mintzberg (1979) also distinguishes nine design parameters – the basic components of organisational structure – which are used to divide and coordinate work processes within an organisation. These nine parameters fall into four bigger groups: design of positions, design of superstructure, design of lateral linkages and design of decision-making system. Next to the design parameters, Mintzberg (1979) also distinguishes four contingency factors, which represent the organisational states or conditions that are associated with the use of certain design parameters. The four contingency factors are age and size, technical system, environment and power.

3.2.1 GROUPING OF DEPARTMENTS

An important part of designing the structure of an organisation is the grouping of departments, since this is a fundamental means to coordinate work in the organisation (Mintzberg, 1979). Grouping activities into departments will establish the system of formal authority and built the hierarchy of the organisation (Mintzberg, 1979). Grouping activities into departments can be done based on different aspects, like function, products or work processes. This section will discuss five options for departmental grouping: functional, divisional, matrix, horizontal and network grouping.

Functional grouping

In a functional structure activies are grouped together based on function from the top to the bottom of the organisation (Daft, Murphy & Willmot, 2010). An example of the functional organisation struture is shown in Figure 3.6. In such a structure all knowlegde and skills regarding a specific activity are thus placed together, which has an advantage of providing a valuable depth of knowledge and skills for the organisation (Daft, Murphy & Willmot, 2010). Besides this advantage, the functional organisation also supports a simple decision-communciation network (Duncan, 1979).

Divisional grouping

In a divisional structure divisions are organised according to individual products, services, product groups, major projects, divisions, businesses or profit centres (Daft, Murphy & Willmot, 2010). Figure 3.7 shows an example of a divisional structure. "The distinctive feature of a divisional structure is that grouping is based on organisational outputs" (Daft, Murphy & Willmot, 2010, p. 109). Another characteristic of the divisional structure is that it decentralises decision making, as the lines of authority converge at a lower level in the organisation (Daft, Murphy & Willmot, 2010). A divisional structure is particular effective when the organisation's context is very complex, for example, when there are multiple factors that need to be considered in the decision-making process (Duncan, 1979). Many government organisations use a divisional structure (Daft, Murphy & Willmot, 2010).

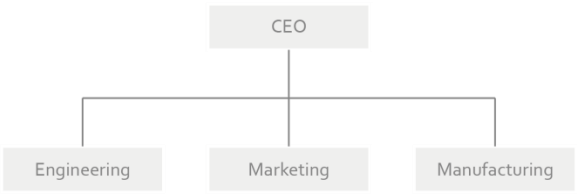


Figure 3.6 – Functional grouping (Daft, Murphy & Willmot, 2010) edited

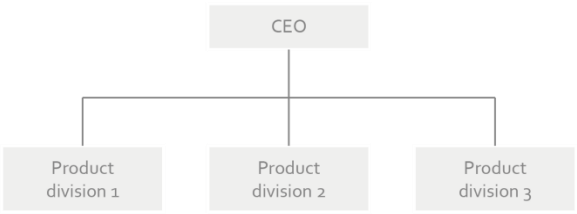


Figure 3.7 – Divisional grouping (Daft, Murphy & Willmot, 2010) edited

Matrix grouping

A matrix structure is used to give equal emphasis and attention to product and function, or product and geography; it is based on a dual hierarchy (Daft, Murphy & Willmot, 2010). In a matrix structure activities are thus not grouped together based on one factor. An example of the matrix organisation struture is shown in Figure 3.9. "A dual-authority structure can help ensure a balance between vertical and horizontal aspects of organisations" (Daft, Murphy & Willmot, 2010, p. 115).

Horizontal grouping

In a horizontal structure employees are organised around core processes (Daft, Murphy & Willmot, 2010). Figure 3.10 shows an example of a horizontal structure. Self-directed teams are the basis of organisational design and performance of

this structure. These teams have the freedom to think creatively and respond flexibly. The organisation culture which fits this structure is one of openess, trust and collaboration.

Virtual network grouping

With a virtual network structure, an organisation subcontracts many or most of its processes to external providers (outsourcing) and coordinates their activities from a small headquarters organisation (Daft, Murphy & Willmot, 2010). An example of the virtual network organisation struture is shown in figure 3.11. The network organisation may be viewed as a central hub surrounded by a network of external providers. This idea behind the outsourcing of activities, is that the organisation can focus on its core competence.

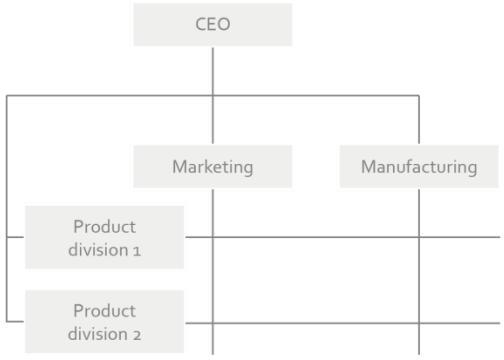


Figure 3.8 – Matrix grouping (Daft, Murphy & Willmot, 2010) edited

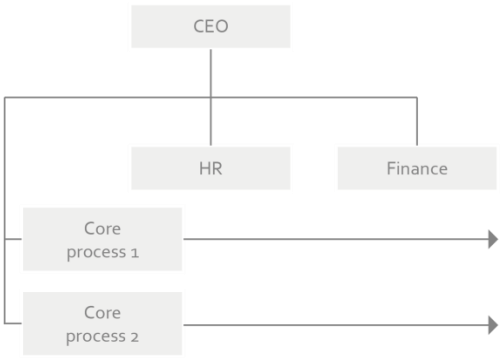


Figure 3.9 – Horizontal grouping (Daft, Murphy & Willmot, 2010)

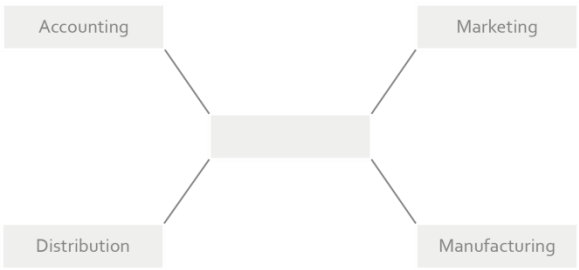


Figure 3.10 – Virtual network grouping (Daft, Murphy & Willmot, 2010) edited

3.2.1 VERTICAL AND HORIZONTAL LINKAGES

"Linkage is defined as the extent of communication and coordination among organisational elements" (Daft, Murphy & Willmot, 2010, p. 98). The structure of an organisation should provide the possibility to have both vertical and horizontal linkages (Daft, Murphy & Willmot, 2010). However, there is a certain tension between vertical and horizontal mechanisms. Whereas vertical flows provide the mechanism for control, horizontal flows are designed for coordination and collaboration (Daft, Murphy & Willmot, 2010). **Figure 3.12** compares vertical organisations with horizontal organisations. Vertical linkages are used to coordinate activities between the top and bottom of an organisation, whereas horizontal linkages are used to coordinate activities across horizontal departments (Daft, Murphy & Willmot, 2010).

Figure 3.11 – The relationship of organisational design to efficiency versus coordination and collaboration (Daft, Murphy & Willmot, 2010) edited

Vertical linkages

"Vertical linkages are used to coordinate activities between the top and bottom of an organisation and are designed primarily for control of the organisation" (Daft, Murphy & Willmot, 2010, p. 98). There are different ways to achieve vertical linkage, like hierarchical referral, rules, plans and formal management information systems.

The first way to achieve vertical linkage is through the hierarchy – chain of command – of the organisation (Daft, Murphy & Willmot, 2010). Problems can be referred up to the next level in the hierarchy and the solution can again passed back down to lower levels. This line of communication between different levels of hierarchy is an important part of vertical linkage. Another way to achieve vertical linkage is the use of rules and plans (Daft, Murphy & Willmot, 2010). Rules and plans provide a standard information source which enables employees to be coordinated without having to communicate about every task. A vertical information system is another way to achieve vertical linkage (Daft, Murphy & Willmot, 2010). Information systems make communication up and down the hierarchy more efficient.

Horizontal linkages

Horizontal linkage refers to the amount of communication and coordination horizontally across organisational departments (Daft, Murphy & Willmot, 2010). "Horizontal communication overcomes barriers between departments and provides opportunities for coordination among employees to achieve unity of effort and organisational objectives" (Daft, Murphy & Willmot, 2010, p. 99). There are different ways to achieve horizontal coordination and information flows, like using information systems and having direct contact, task forces, a full-time integrator or teams.

Information systems can enable employees to routinely exchange information about problems, opportunities, activities or decisions (Daft, Murphy & Willmot, 2010). Information systems can also help to build relationships all across the organisation, aiming to support and enhance ongoing horizontal coordination. A higher level of horizontal linkage is direct contact between employees affected by a problem (Daft, Murphy & Willmot, 2010). One way to do this is to create a liaison person which is located in one departments but has the responsibility for communicating and achieving coordination with another department. A liaison role usually links only two departments, so when linkage involves more departments, a task force is required (Daft, Murphy & Willmot, 2010). A task force is composed of representatives from each organisational department affected by a problem. Task forces solve problems by direct horizontal coordination and reduce the information load on the vertical hierarchy. Another way is to create a full-time position or department solely for the purpose of coordination (Daft, Murphy & Willmot, 2010). The full-time integrator is located outside the departments and has the responsibility for coordinating several departments. The strongest horizontal linkage mechanism is project teams (Daft, Murphy & Willmot, 2010). Team are permanent task forces and are often used in conjunction with a full-time integrator.

Each of the five structures is applied in different situations and addresses different demands. Organisations can use a particular structure as a way to become more or less effective, depending on the situation and the capacity of the structure to respond effectively to their demands (Daft, Murphy & Willmot, 2010). "One of the most important roles of top managers in structural design is finding the right balance between vertical control and horizontal coordination, depending on the constantly changing needs of the organisation" (Daft, Murphy & Willmot, 2010, p. 126). Vertical control tends to be associated with goals of efficiency and stability, while horizontal coordination is associated with learning, innovation and flexibility. Each of the five structures can be placed on a continuum between vertical and horizontal organisations (see **figure 3.13**).

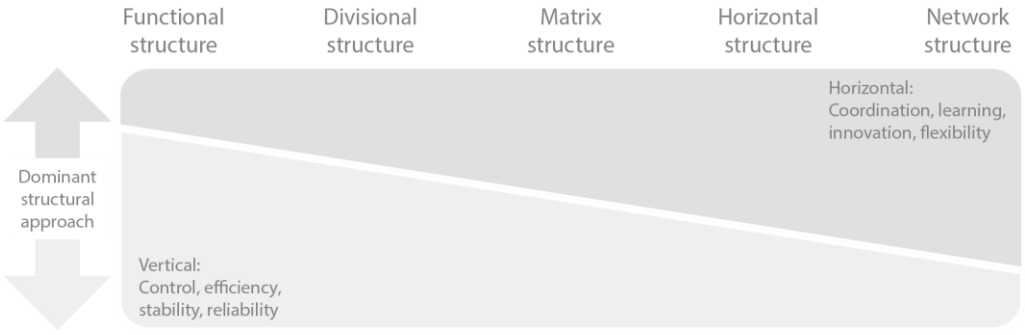


Figure 3.12 – The relationship of organisational structures and vertical control versus horizontal coordination (Daft, Murphy & Willmot, 2010) edited

4.1.2.1 Horizontal and vertical decentralisation

As Daft, Murphy and Willmot (2010) state, the structure of an organisation should provide the possibility to have both vertical and horizontal linkages. Mintzberg (1979) also distinguishes these two forms of linkages when discussing decentralisation.

As stated by Mintzberg (1979), "vertical decentralisation is concerned with the delegation of decision-making power down the chain of authority" (p. 188). With vertical decentralisation, the focus is on formal power and to make decisions and authorize them. Three important design issues arise in vertical decentralisation: 1) What decision powers should be delegated down the chain of authority? 2) How far down the chain should they be delegated? And 3) How should

their use be coordinated? Mintzberg (1979) concludes that an organisation can be considered a system of work constellations. Each constellation exists at that level in the hierarchy where the information concerning the decisions of a certain area can be accumulated most effectively.

Horizontal decentralisation is concerned with the shift of decision-making power from managers to non-managers (Mintzberg, 1979). With horizontal decentralisation, the focus is on informal power that arises from advising and executing.

3.2.2 FIVE BASIC PARTS OF ANY ORGANISATION

Mintzberg (1979) distinguishes five parts of an organisation: the strategic apex, the middle line, the operating core, the support staff and the technostructure. These five basic parts, which make up the structure of an organisation, are shown in Figure 3.13.

The strategic apex is at the top of the hierarchy and consists of top-level managers and their own personal staff (Mintzberg, 1979). At the base of the organisation is the operating core, wherein the operators carry out the basic work of the organisation. Between the strategic apex and the operating core, the middle line is located, which consists of managers who join the strategic apex to the operating core through the chain of command. The support staff and the technostructure are located next to the middle line managers. The support staff supports the functioning of the operating core indirectly, that is, outside the basic flow of operating work. The technostructure consists of analysts which carry out their work of standardizing the work of others.

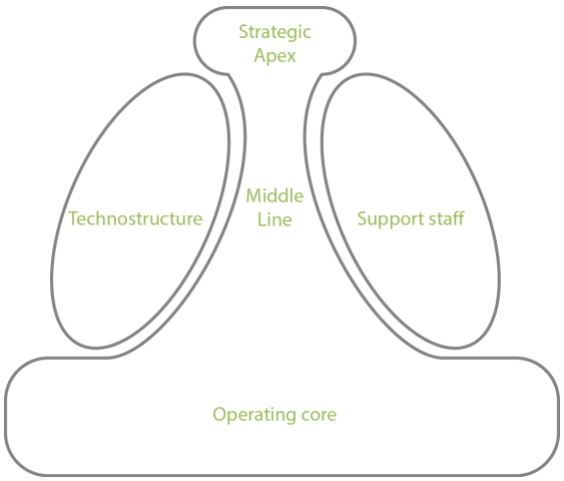


Figure 3.13 – The five basic parts of organisations (Mintzberg, 1979) edited

The strategic apex consists of people charged with overall responsibility for the organisation and their secretaries, assistants, and so on (Mintzberg, 1979, p. 24). The objective of the strategic apex is ensuring that the organisation serves its mission in an effective way and that it serves the needs of those people who control or have power over the organisation, such as government agencies.

The operating core consists of the operators: the people who perform the basic work related directly to the products and services (Mintzberg, 1979). The operators have four functions: they secure the inputs for productions, they transform the inputs into outputs, they distribute the outputs and they provide direct support to the input, transformation and output functions. “The operating core is the heart of every organisation, the part that produces the essential outputs that keep it alive” (Mintzberg, 1979, p. 24).

The middle line connects the strategic apex to the operating core by the chain of middle-line managers with formal authority (Mintzberg, 1979). The chain of authority runs from the senior managers just below the strategic apex to the first-line supervisors, who have direct authority over the operators. “In general, the middle-line manager performs all the managerial roles of the chief executive, but in the context of managing his own unit” (Mintzberg, 1979, p. 26). However, these managerial roles change as they descend in the chain of authority, they become more detailed and elaborated, less abstract and more focused on the work flow itself.

The technostructure consists of analysts, and their supporting staff, who serve the organisation by affecting the work of others by standardisation (Mintzberg, 1979). The technostructure may perform at all levels of the hierarchy; at the lowest levels analysts standardise the operating work, at the middle levels analysts standardise the intellectual work of the organisation, and at the top level analysts design strategic planning systems to control the goals of major units.

Every organisation has a great number or units that provide support to the organisation outside the operating work flow (Mintzberg, 1979). These units form the support staff of an organisation. Support units are self-contained: they take resources from the larger organisation and, in turn, provide specific services to the organisation. The support units operate at various levels of the hierarchy, depending on the receivers of their service.

3.2.3 ORGANISATIONAL CONFIGURATIONS

Mintzberg (1979) developed a typology of five distinctive organisations: the simple structure, the machine bureaucracy, the professional bureaucracy, the divisionalised form and the adhocracy. These five types of organisation are shown in Figure 3.14. Each of these types has their own structural configuration, characteristics and advantages and disadvantages. The different types of organisations according to Mintzberg (1979) are discussed below.

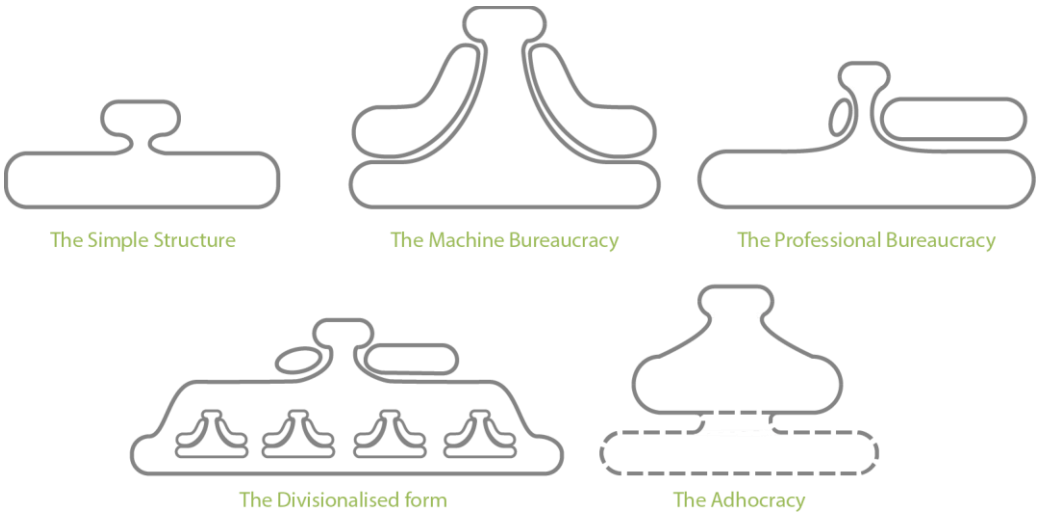


Figure 3.14 – Typology of organisations (Mintzberg, 1979) edited

The Simple Structure

The simple structure has a small or non-existing technostructure and no support units, a loose division of labour, minimal differentiation among its unit and a small managerial hierarchy (Mintzberg, 1979). Coordination is effected by direct supervision. Since all power is centralised in the top of the hierarchy, the strategic apex is the key part of the organisation. The simple structure is most often applied in small organisations and simple and dynamic environments.

This structure has the advantage of ensuring that the strategic apex has full knowledge of the operating core and that it ensures flexibility and adaptability, since the strategic apex only consists of one person: the CEO. The disadvantage of this is that the whole organisation depends on only one person, which is risky but can also cause confusion between strategic and operating issues.

The Machine Bureaucracy

The machine bureaucracy has a fully developed middle line and highly a elaborated technostructure and support structure, very formalised procedures in the operating core, highly standardised work processes and a proliferation of rules, regulations and formalised communication throughout the organisation (Mintzberg, 1979). Because the Machine Bureaucracy depends primarily on the standardisation of its operating work processes for coordination, the technostructure is the key part of the organisation. The machine bureaucracy is most often applied in old, mature and large organisations and simple and stable environments.

When simple, repetitive tasks must be performed precisely and consistently, the machine bureaucracy is most efficient, since it has highly standardised work processes. However, the disadvantage of this is that there is not much focus on the human factor of the work processes. Also, the machine bureaucracy is not designed to handle conflict, which causes coordination problems to go up higher in the hierarchy. Lastly, the machine bureaucracy does not response well to a dynamic environment, because of the highly standardises work processes.

The Professional Bureaucracy

The professional bureaucracy has a fully elaborated support structure, a not highly elaborated technostructure and middle line, relies on the standardisation of skills and consists of duly trained and indoctrinated specialists (professionals) (Mintzberg, 1979). The operating core is the key part of the organisation. The professional bureaucracy is most often applied in complex and stable environments.

This structure has the advantage of both disseminating power directly to the workers, but also providing extensive autonomy, which creates responsible and highly motivated individuals, who can perfect their skills free of interference. This

disadvantage of this is that this standardisation of skills fails to cope with problems of coordination, discretion and innovation.

The Divisionalised form

The divisionalised form has a rather small technostructure and strategic apex and a slightly larger support structure, relies on the standardisation of outputs and consists of divisions which each have their own structure rather than a complete structure from strategic apex to operating core (Mintzberg, 1979). The middle line is the key part of the organisation. The divisionalised form is most often applied in simple and stable environments.

The divisionalised form encourages efficient allocating of capital, helps to train general managers, spreads it risks and is strategically responsive. However, the disadvantage of this structure is that it centralises power not only at the divisional level but also at headquarters level, which can result in the concentration of enormous amounts of power in very few hands.

The Adhocracy

The adhocracy has an organic structure, with little formalization of behaviour and selective decentralisation (Mintzberg, 1979). The technostructure, middle line and support units blend into a single effort. However, the operating core is cut off from the rest of the organisation. The adhocracy is most often applied in dynamic and complex environments.

The disadvantage is the ambiguity of the adhocracy; members of the organisation have a low tolerance for this. Another disadvantage is that the adhocracy is not very cost-efficient, due to the high cost of communication.

The University – The Professional Bureaucracy

Considering the five structural configurations proposed by Mintzberg (1979), a university organisation can be described as a *professional bureaucracy*. The structure of professional bureaucracies is essentially bureaucratic. The Professional Bureaucracy is a highly decentralised organisation that is decentralised in both vertical and horizontal direction. The organisation is decentralised in the vertical dimension because this power rests at the bottom of the hierarchy: with the professionals – the teachers and researchers (Mintzberg, 1979). The organisation is decentralised in the horizontal dimension since this power rests with the non-managers – the directors of the supporting services (Mintzberg, 1979). The professional bureaucracy consists of parallel hierarchies: one democratic and bottom up for the professionals, and a second bureaucratic and top down for the support staff. Standardisation of competences is the main coordination mechanism, and trained professionals are hired for the operating core. The individual teachers, the researchers and the research teams belong to the core of the organisation. The professionals' tasks – education and research – are standardised by means of training and intensive learning processes. As Mintzberg (1979) states, these professionals are given considerable control over their own work (p. 349). The support staff is considerable large, as they need to support the many professionals and primary process. The real estate department is one of these support services, and thus is part of the support staff. The strategic apex is comprised by the Supervisory Board and the Executive Board of the university. The middle line and technostructure is relatively small; the middle line managers are comprised by the directors and deans of the faculties.

STUDENT ACCOMMODATION, UNIVERSITY OF TWENTE
PHOTO: UT

CHAPTER 4 – ANALYTICAL FRAMEWORK

University real estate organisations are heavily influenced by the context in which they operate. Within this dynamic context, a particular organisational structure is chosen. University real estate organisations seek to attain the organisational structure that supports the management of their real estate. To understand and describe the relationship between organisational structure and university real estate management, the concepts of Corporate Real Estate Management and organisational structure must be combined.

The previous chapter provided theoretical background on the concepts of Corporate Real Estate Management and organisational structure. These are all general theories which can be applied to the university real estate department and university real estate management. In an attempt to combine the different concepts of Corporate Real Estate Management and organisational structure, and create an analytical framework, it can be concluded that the relationship between university real estate management and organisational structure consists of two dimensions. First, there is the role of real estate management within the university. The role can be described by the organisational structure of the overall organisation and the real estate department. Secondly, there is the management of university real estate. The dimension of university real estate management can be described by the integration of the four stakeholder perspectives in the real estate management process. Figure 4.1 illustrates these two dimension.

The two dimensions – *organisational structure* and *university real estate management* – form the basis for the design of the analytical framework. This chapter discusses theories and considerations of several studies concerning the two distinctive dimensions, which results in the formulation of the analytical framework.

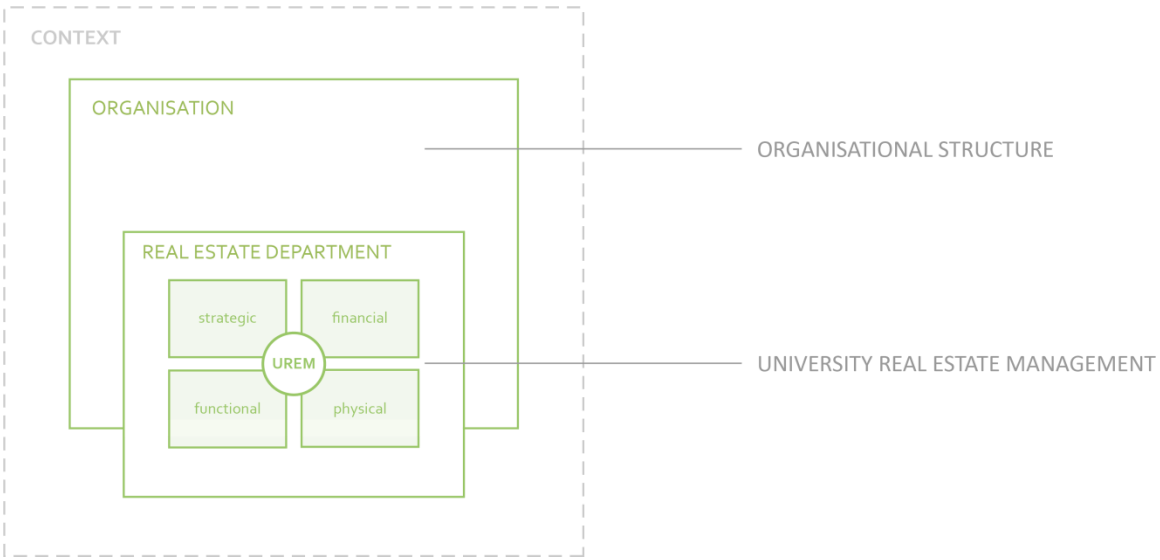


Figure 4.1 – The two dimensions of the relationship between organisational structure and university real estate management (own illustration)

4.1 ORGANISATIONAL STRUCTURE

The dimension *organisational structure* refers to the role of real estate management within the university. The role can be described by the organisational structure of the university and the real estate department. The organisational structure can be determined by four structural choices: the level of sourcing, the level of centralisation, the level of concentration, and the position of the real estate department within the university. In this section these four structural choices are explained in more detail.

4.1.1 LEVEL OF SOURCING

The variable 'sourcing' refers to whether a public organisation should allocate its REM activities in-house or to external providers (Evers, van der Schaaf, Dewulf, 2002). When these activities are allocated to external providers, it is called outsourcing. Outsourcing refers to the process in which services are changed from being carried out in-house into being provided by an external service provider (Jensen, 2008, p. 29). Figure 4.2 illustrates the two options for this variable: in-house or outsourced.

The principal reason for outsourcing is cost reduction (Evers, van der Schaaf & Dewulf, 2002, p. 100). Outsourcing real estate activities creates the possibility for economical savings (de Jong et al., 2013). Also, external service providers can execute the real estate activities more cost efficient (de Jong et al., 2013). However, outsourcing is also a complex and time-consuming process, which eventually can lead to more costs. In general, processes and activities vital to the organisation should not be outsourced (Evers, van der Schaaf & Dewulf, 2002; McDonagh & Hayward, 2000). Processes and activities vital to the organisation are those which add most value to the organisation and that have an important impact on the business process, and thus belong to the core competence of the organisation (Evers, van der Schaaf & Dewulf, 2002).

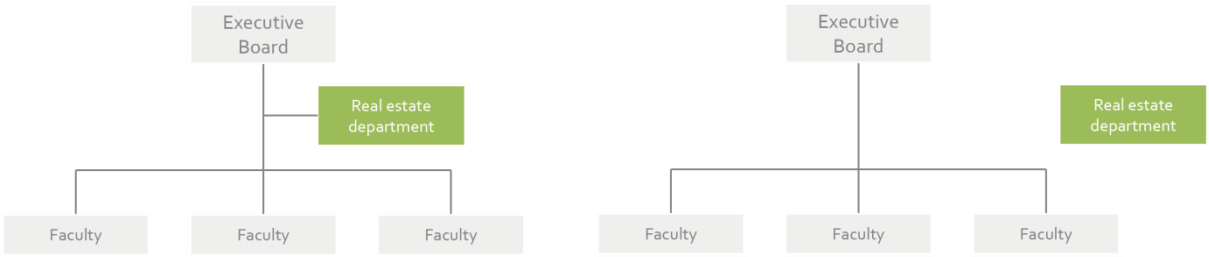


Figure 4.2 – In-house real estate management (left) versus outsourced real estate management (right) (own ill.)

Models for sourcing

Based on the framework of Matser (2018), the level of sourcing can be expressed by three models of sourcing: the administrative model, the coordinating model and the demand model (**figure 4.3**). These three models of sourcing are distinguished by de Jong et al. (2013). The three models are distinguished by the level of outsourcing.

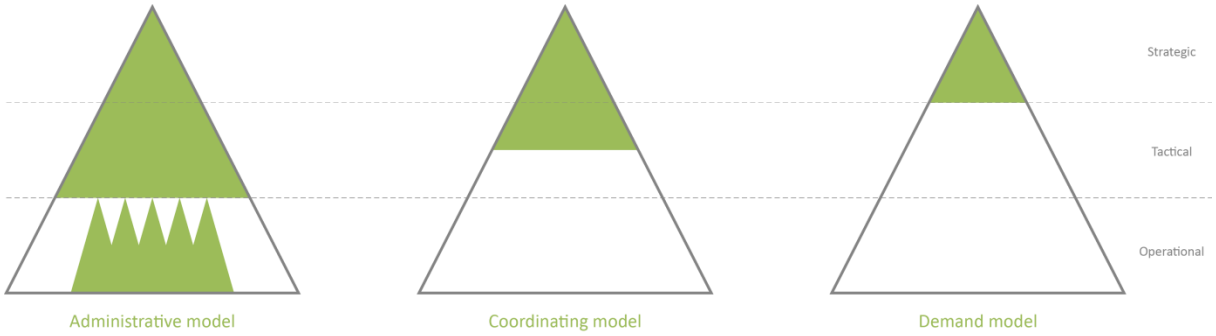


Figure 4.3 – Models for sourcing (de Jong et al., 2013) edited

Administrative model

In an administrative organisation, almost all real estate management activities are managed in-house (de Jong et al., 2013). Only in larger real estate projects, external providers are hired. The focus of this organisation is on the products and services to be delivered, and thus, the real estate department is structured by the products and services and contains several specialists. The real estate department focuses on deploying sufficient staff in order to meet the client's demands (de Jong et al., 2013).

Coordinating model
In a coordinating organisation, all operational and most tactical tasks are outsourced (de Jong et al., 2013). Since all these tasks are outsourced, the real estate department can focus more on the demand and supply of real estate, and thereby focuses on describing, monitoring and continuously improving the process of matching demand and supply. In contrast to the administrative organisation, the focus of the coordinating organisation is on the internal client relationship, and thus, the real estate department is structured by this relationship.

Demand model
In a demand organisation, all operational and tactical tasks are outsourced (de Jong et al., 2013). When outsourcing, the demand organisation attracts only one supplier, which takes responsibility for all tactic and operational activities (Matser, 2018). According to de Jong et al. (2013), the real estate department is responsible for coordinating and monitoring the external service provider as well as taking part in strategic decision-making processes.

4.1.2 LEVEL OF CENTRALISATION

The variable 'centralisation' refers to whether a central real estate unit or individual departments should be responsible and accountable for real estate decision-making (Evers, van der Schaaf & Dewulf, 2002). When the real estate decision-making process is executed by a central real estate unit, it is called centralisation, when it is executed by different departments is it called decentralisation. The two options for this variable are presented in Figure 4.4: centralised or decentralised.

Whether an organisation chooses to centralise or to decentralise depends on the objectives of the organisation, the added value of the real estate assets and the political, and financial situation of the organisation (Evers, van der Schaaf & Dewulf, 2002; Bank & den Heijer, 2004). Decentralisation is one of the most important organisational restructurings of the past years (Faguet, 2014). Studies have shown that decentralisation can increase flexibility and political stability and improve service delivery and citizen representation (Hankla & Downs, 2010;, van der Schaaf, 2002, World Bank, 1999). However, a consequence of decentralisation can be that the management activities become scattered throughout the organisation and that the alignment of organisational goals and objectives between different departments becomes more difficult, since each department has its own interests and goals.

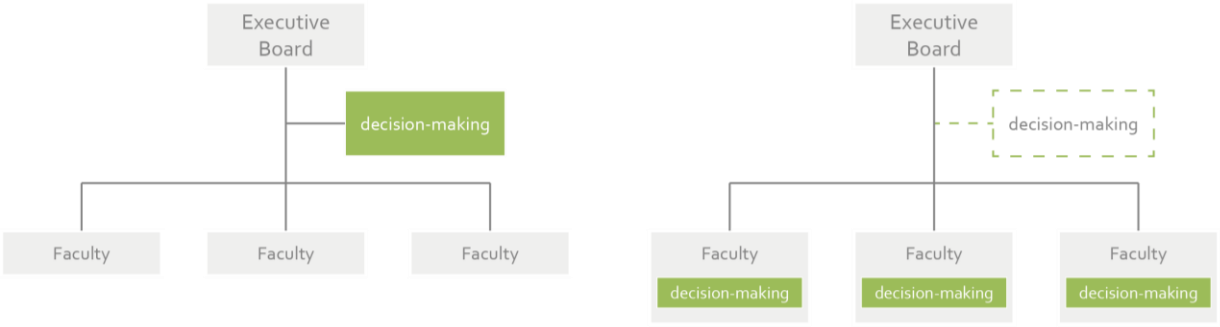


Figure 4.4 – Centralised decision-making (left) versus decentralised decision-making (right) (Bank & den Heijer, 2004) edited

4.1.3 LEVEL OF CONCENTRATION

The level of concentration refers to whether a central real estate unit or individual departments should be responsible for the operation of real estate management activities (Bank & den Heijer, 2004; Hoendervanger, Wijnja & van der Voordt, 2017). When the real estate management activities are executed by a central real estate unit, it is called concentration, when they are executed by different departments is it called deconcentration (see **Figure 4.7**).

The level of concentration is often confused with the level of centralisation (Bank & den Heijer, 2004; van der Schaaf, 2002). Centralisation and decentralisation have to do with decisive power and money, whereas concentration and deconcentration are about the grouping of activities (van der Schaaf, 2002; Evers, van der Schaaf & Dewulf, 2002; Bank & den Heijer, 2004). Centralised decision-making combined with deconcentrated knowledge and services is very well possible (van der Schaaf, 2002; Evers, van der Schaaf & Dewulf, 2002; Bank & den Heijer, 2004). However, with concentrated knowledge and services the risk is that the operation of real estate does not match with the primary processes of the organisation. The greater the differences between decentralised departments, the more difficult it becomes to align the

concentrated knowledge and services. In the event of large differences between different departments, therefore, it is better to have a deconcentration of operation activities (Bank & den Heijer, 2004).

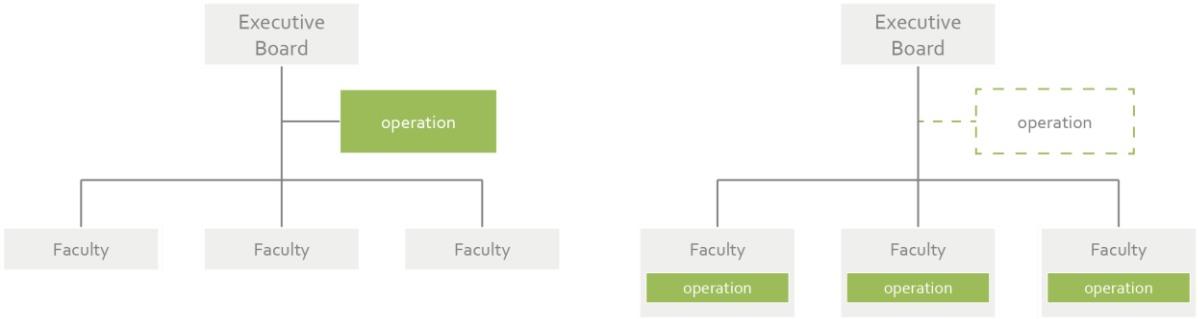


Figure 4.7 – Concentrated operation (left) versus deconcentrated operation (right) (Bank & den Heijer, 2004) edited

Models for concentration

Based on the framework of Matser (2018), the level of concentration can be expressed by three models of concentration: the concentrated model, the deconcentrated model and the integrated model (Figure 4.8). These three models of sourcing are distinguished by Hoendervanger, Wijnja & van der Voordt (2017).

In the concentrated model, all management activities are clustered in one place in the organisation: the real estate department (Hoendervanger, Wijnja & van der Voordt, 2017). In this model, all knowledge and skills are clustered, the decision-making process is fast and the lines of reporting are short. In the deconcentrated model, the management activities are spread across different departments of the organisation (Hoendervanger, Wijnja & van der Voordt, 2017). In the integrated model, the real estate management department works closely with other service activities, like the IT or HR department (Hoendervanger, Wijnja & van der Voordt, 2017). The different departments form one integrated department which is called a shared service center.

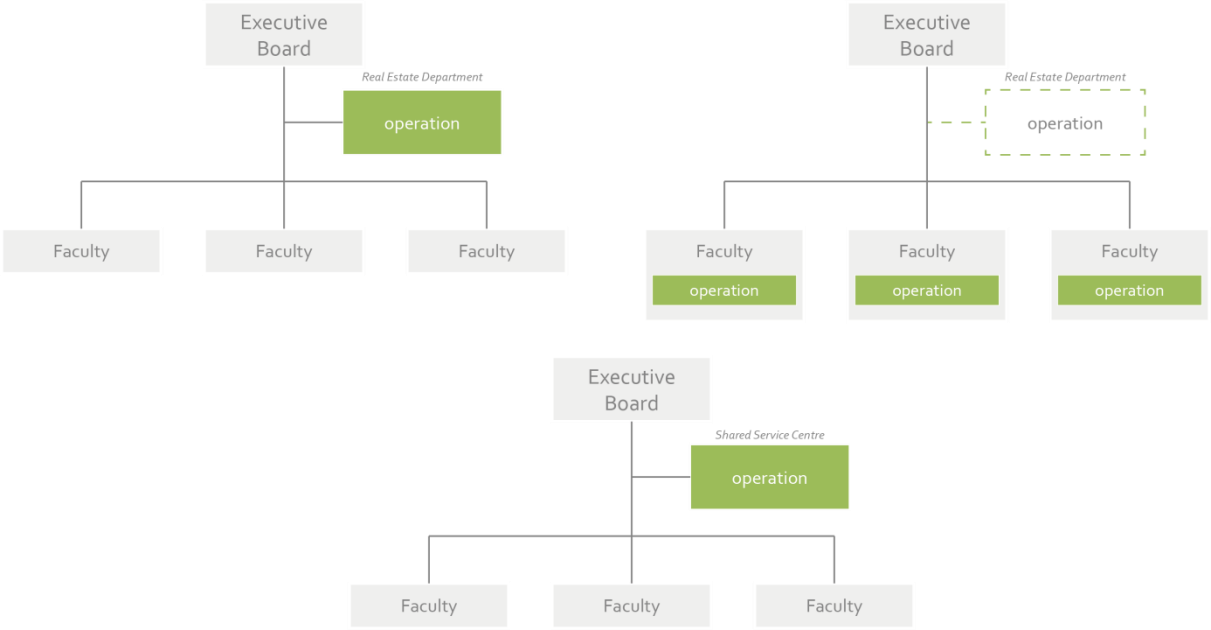


Figure 4.8 – Three models for concentration (Hoendervanger, Wijnja & van der Voordt, 2017) edited

4.1.4 POSITION REAL ESTATE DEPARTMENT

The level of sourcing, centralisation and concentration already largely determine the role of the real estate management within the university. The position of the real estate department is another relevant structural determinant for this role. When the real estate department is located close to the Executive Board, the department has a 'high' position with the organisation; when the real estate department is located close to the faculties, the department has a 'low' position (Bank & den Heijer, 2004). The two positions – close to the Executive Board or close to the faculties – are illustrated in Figure 4.9.

A real estate department close to the Executive Board has little decision-making authority and needs approval from the Executive Board for larger (financial) decisions (Bank & den Heijer, 2004). A major advantage of having a high position is that the real estate department is aware of the institutional objectives, and thus can align its real estate policy accordingly (Bank & den Heijer, 2004). However, a disadvantage of a high position is that the distance between the real estate department and the users becomes bigger, and therefore real estate can be less well aligned with the primary process (Bank & den Heijer, 2004).

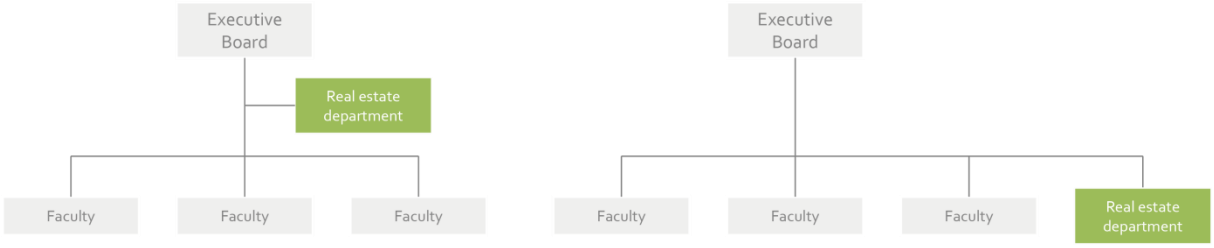


Figure 4.8 – 'High position' (left) versus 'low' position (right) (Bank & den Heijer, 2004) edited

4.2 UNIVERSITY REAL ESTATE MANAGEMENT

The second dimension, *university real estate management*, refers to the integration of the different stakeholder perspectives in the real estate management process. This integration can be determined by assessing the stage of development of the real estate department from each of the four stakeholder perspectives. An assessment model is used to measure the development stage of the university real estate department from each stakeholder perspective. The assessment model combines the four perspectives of Corporate Real Estate Management determined by den Heijer (2011) – *strategic*, *functional*, *financial* and *physical* – and the five-stage development model of Joroff et al. (1993) – *task manager*, *controller*, *dealmaker*, *intrapreneur*, and *business strategist*. For each CREM perspective, assessment criteria are described to measure which stage of development fits the real estate department. A note here has to be made: there are no right or wrong stages; the stage of development is just a tool to determine whether the real estate department's behaviour and focus meets the university's current needs (Joroff et al., 1993). Table 4.3 presents the assessment model.

The assessment model is based on previous research. The model uses the theory of den Heijer (2011) and Joroff et al. (1993) as a starting point. In addition to the literature, the assessment model is based on two previously established models by Wu (2015) and van der Zwart (2014).

Wu (2015) proposes a model to measure the maturity level of the university real estate department. The model also links the four stakeholder perspectives to the five stages of development by Joroff et al. (1993). Maturity level is a normative concept, which means lower levels are perceived as bad or undesirable, while high levels are perceived as good or desirable. When assessing the stage of development, there is no right or wrong; it all depends on the context of the real estate department. Therefore, the model proposed by Wu (2015) is not sufficient for assessing the integration of the different stakeholder perspectives in the real estate management process. However, the model does use six assessment criteria that are relevant, and are used in this study: *awareness*, *goal focus*, *innovation level*, *tools and systems*, *skills,* and *expertise and communication*.

Van der Zwart (2014) proposes a similar model to assess the real estate perspectives. The model also combines the four stakeholder perspectives with the five stages of development by Joroff et al. (1993). The assessment criteria used in the model are not fully elaborated on. Therefore, the model proposed by van der Zwart (2014) is not sufficient for assessing the development stage of the university real estate department.

	Strategic	Functional	Financial	Physical
	aligning real estate with institutional goals	aligning real estate with (primary) processes	aligning real estate financial value, risks and costs with production of products and services	maintaining quantity and quality of current and future real estate
Task manager	* supply in university's demand for real estate * senior management is involved with real estate department	* supply in faculties' demand for real estate * real estate enables students and researchers to produce knowledge	* supply in demand for real estate within budgets * real estate is viewed as neither a cost nor benefit	* supply in demand for real estate * provide general service on real estate as needed * corrective maintenance
Controller	* real estate department reports results to the senior management * presence of statements related to strategic goals, but not made explicit in plans	* physical environment optimal for primary process * analyses of primary processes * interaction and dialogue with faculties about their short- and long-term needs	* supply in demand for real estate at the lowest cost possible * awareness of potential costs and benefits of real estate * control and minimize real estate costs * analytical focus	* awareness of technical building costs * reducing square meters * presence of statements related to sustainability goals, but not made explicit in plans
Dealmaker	* strategic focus is made explicit in plans * real estate department communicates regularly with senior management * real estate department behaves proactively and comes up with new ideas	* physical environment optimal for faculties * analyses of user satisfaction * real estate department works together with faculties to identify the optimal space needs * standardisation real estate usage	* presence of financial tools and systems * balancing real estate costs against increasing costs of primary process * internal costing of real estate costs * analysing and documenting sources of market value	* basic inventory routines on real estate * focus on sustainability is made explicit in plans * analysis of physical aspects real estate portfolio * presence of maintenance plans * preventive maintenance
Intrapreneur	* full implementation or ongoing execution of strategic plans * long-term strategic planning * real estate department works closely together with senior management * matching the real estate department's strategy to its competitors' * real estate department coordinates plans with other support services	* overview of space use * overview of occupancy rates and frequency rates of real estate * real estate department works closely together with faculties and is involved in faculties' strategic planning processes * proposing real estate data and alternatives to faculties	* balancing real estate costs against optimising and increasing productivity * proving importance real estate through measurable results * real estate department acts as profit center * presence of financial controllers within the real estate department * long-term financial planning * scenario and risk planning	* full implementation or ongoing execution of sustainability plans * full implementation or ongoing execution of maintenance plans * proposing innovative and sustainable solutions * overview of real estate's energy performance * long-term maintenance planning
Business strategist	* generating future strategic plans for continuous improvement * high frequency of revising and adjusting real estate plans to match the changing demands * anticipating on trends, measuring and monitoring their impacts and contributing to the direction of the university as a whole * real estate department is closely aligned with senior management * real estate adds value to institutional goals and thereby improves the competitive advantage	* generating future plans to improve space use and thereby maximise efficiency * a state of the art learning and working environment * real estate department and faculties begin to regularly integrate space requirements and the real estate strategy into their joint initiatives * real estate adds value to the primary process and thereby improves the productivity * anticipating on trends, measuring and monitoring their impacts	* high frequency of revising and adjusting financial plans to match the strategic plans and changing demands * willingness to invest a larger amount of money in projects which create added value on the long-term *(balance between financial value, risks &costs and added value)* * real estate adds value to financial goals and thereby improves the profitability * real estate department is closely aligned with CFO * anticipating on trends, measuring and monitoring their impacts	* generating future sustainability plans for continuous improvement * willingness to keep outdated buildings which create added value in other aspects *(balance between physical condition and added value)* * real estate adds value to sustainability goals and thereby improves the sustainable development * anticipating on trends, measuring and monitoring their impacts

Table 4.1 – Assessment of development stage from real estate perspectives (based on den Heijer, 2011; Joroff et al., 1993; van der Zwart, 2014; Wu, 2015)

4.2.1 STRATEGIC PERSPECTIVE

The strategic perspective focuses on adding value to the institutional goals and accommodating the primary processes (den Heijer, 2011). The stage of development from a strategic perspective is determined by the level of strategic focus, and is directly linked to the competitive advantage of an organisation (den Heijer, 2011). The *strategic focus* is made explicit in plans. Thus, the presence of strategic real estate plans, and the implementation of these plans, are indicators for the strategic focus of the real estate department. Another important assessment criterion is *communication and collaboration.* In the five-stage development model of Joroff et al. (1993), each stage of development brings the real estate department closer to senior management (p. 26). In the case of universities, senior management is the Executive Board and the Supervisory Board. Regular communication between the real estate department and senior management is important for the conformity between the real estate plans and the university's strategic plans. Therefore, communication and collaboration with the Executive Board and the Supervisory Board is an indicator for the development stage from the strategic perspective.

A real estate department in the first stage of development – the Task Manager – only focuses on providing the space needed for accommodating the primary process. A real estate department which thinks beyond this, focuses on adding value to the institutional goals and thereby improving the competitive advantage of the university. Adding value can be achieved by stimulating collaboration, innovation, culture, and image, as well as improving the quality of space (den Heijer, 2011).

4.2.2 FUNCTIONAL PERSPECTIVE

The functional perspective focuses on aligning real estate with the primary process of the university – education and research. The functional perspective is linked to the productivity of the university (den Heijer, 2011). Productivity refers to the output of universities – being knowledge – in relation to input – being real estate. For the university's productivity, it is therefore essential that real estate enables students and researchers to produce knowledge. Den Heijer (2011) refers to this as the match between *use of space* and *fitness for use*. Den Heijer (2011) also mentions *uses satisfaction* and *user demands* as two relevant indicators for the productivity of the university. Thus, the development stage can be determined by the level of *awareness* of the fitness for use, user satisfaction, and user demands. Another relevant assessment criterion is *communication and collaboration*. The real estate department most important stakeholders are the business units it serves (Joroff et al., 1993). In the case of universities, the business units are the faculties. Being aware of what the faculties demand from their physical environment will support the real estate department in aligning real estate with the primary process. Therefore, communication and collaboration with the faculties is an indicator for the awareness of the real estate department.

At the Task Manager stage, the real estate department only provides the space needed for suitably producing output. A real estate department in the fifth stage – the Business Strategist – is not only aware of the user demands and user satisfaction, but also tries to add value to the primary process, and thereby improving the productivity of the university. Adding value can be achieved by supporting user activities, increasing user satisfaction and increasing flexibility (den Heijer, 2011).

4.2.3 FINANCIAL PERSPECTIVE

From a financial perspective, the real estate department focuses on aligning the costs and benefits of real estate with the costs of the primary process (den Heijer, 2011). The financial perspective is linked to the profitability of the university (den Heijer, 2011). With decreasing government funding, investments in real estate must be weighed against investments in education and research (den Heijer, 2011). Knowing the costs and benefits of real estate, and an efficient application of the financial resources, is therefore essential; if not managed effectively, the costs of real estate will be a drain of the available funds (Musa, 2012 as cited in Wu, 2015). Several financial tools exists that support the real estate department in effectively allocating financial resources, such as a financial planning, a budget, and risk control. Thus, the stage of development is determined by the use of financial *tools and systems.* Another relevant assessment criterion for the financial perspective is the presence of a *financial department* within the real estate organisation. The finance department of the university is responsible for the financial resources of the whole university, and is not solely concerned with real estate. A financial department within the real estate department focuses solely on the financial resources related to real estate. Having such a financial department will help the real estate department to efficiently allocate its financial resources.

A real estate department in the first two stages – the Task Manager and the Dealmaker – only focuses on providing real estate at the lowest cost possible. While real estate departments which think beyond this, not only focus on providing space needed for the primary process, but also reserve part of the budget for adding value to the financial goals, and improving the profitability of the university. The real estate department can add value to financial goals by decreasing the real estate costs, increasing the real estate value and controlling risks (den Heijer, 2011).

4.2.4 PHYSICAL PERSPECTIVE

From a physical perspective, the real estate department focuses on the physical aspects that determine the quality and quantity of both current and future real estate (den Heijer, 2011). The physical perspective is linked to sustainable development. Knowing the current condition of real estate – in terms of quality and quantity –can support decisions about real estate interventions and real estate investments. Therefore, the development stage is determined by the *awareness* of the physical aspects of real estate. The level of *focus on sustainability* is another essential assessment criterion. The focus on sustainability can be made explicit in plans, in which the real estate department expresses its sustainability goals towards its real estate. Thus, the presence of sustainability plans, and the implementation of these plans, are indicators for the focus on sustainability.

A real estate department in the first development stage – the Task Manager – will only focus on maintaining the minimum quality level to allow user activities. While in the fifth stage – the Business Strategist – a real estate department will focus on maintaining the maximum quality level not only for the current real estate, but also for the future real estate. As mentioned, the physical perspective is linked to the indicator sustainable development. Den Heijer (2011) introduces the concept as a performance indicator, next to competitive advantage, productivity and profitability. For a real estate department to focus on sustainable development of its real estate, an important criterion is reducing the ecological footprint (den Heijer, 2011).

4.3 ANALYTICAL FRAMEWORK

The previous section has summarised different theories and considerations related to the position of real estate management within an organisation, and university real estate management. These two distinctive dimensions are combined into one comprehensive framework. Figure 4.10 presents the analytical framework.

The *organisational structure* of real estate management within the university mainly comes down to the division of tasks and responsibilities. To analyse the organisational structure of the university and the real estate department, three variables can be used: the level of centralisation, the level of concentration, and the level of sourcing. The level of centralisation refers to the degree to which the decision-making responsibilities are placed in lower levels of the organisation. The level of concentration refers to whether a central real estate unit or individual departments should be responsible for the operation of real estate management activities. The level of sourcing refers to whether the management of university real estate should be kept in-house or outsourced.

University real estate management can be assessed on the integration of the different stakeholder perspectives into the real estate management process. This integration can be determined by assessing the stage of development of the real estate department from each of the four stakeholder perspectives. The four perspectives of Corporate Real Estate Management determined by den Heijer (2011) – *strategic, functional, financial* and *physical* – are linked to the five-stage development model of Joroff et al. (1993) – *task manager, controller, dealmaker, intrapreneur,* and *business strategist.* For each CREM perspective, assessment criteria are described to measure which stage of development fits the real estate department.

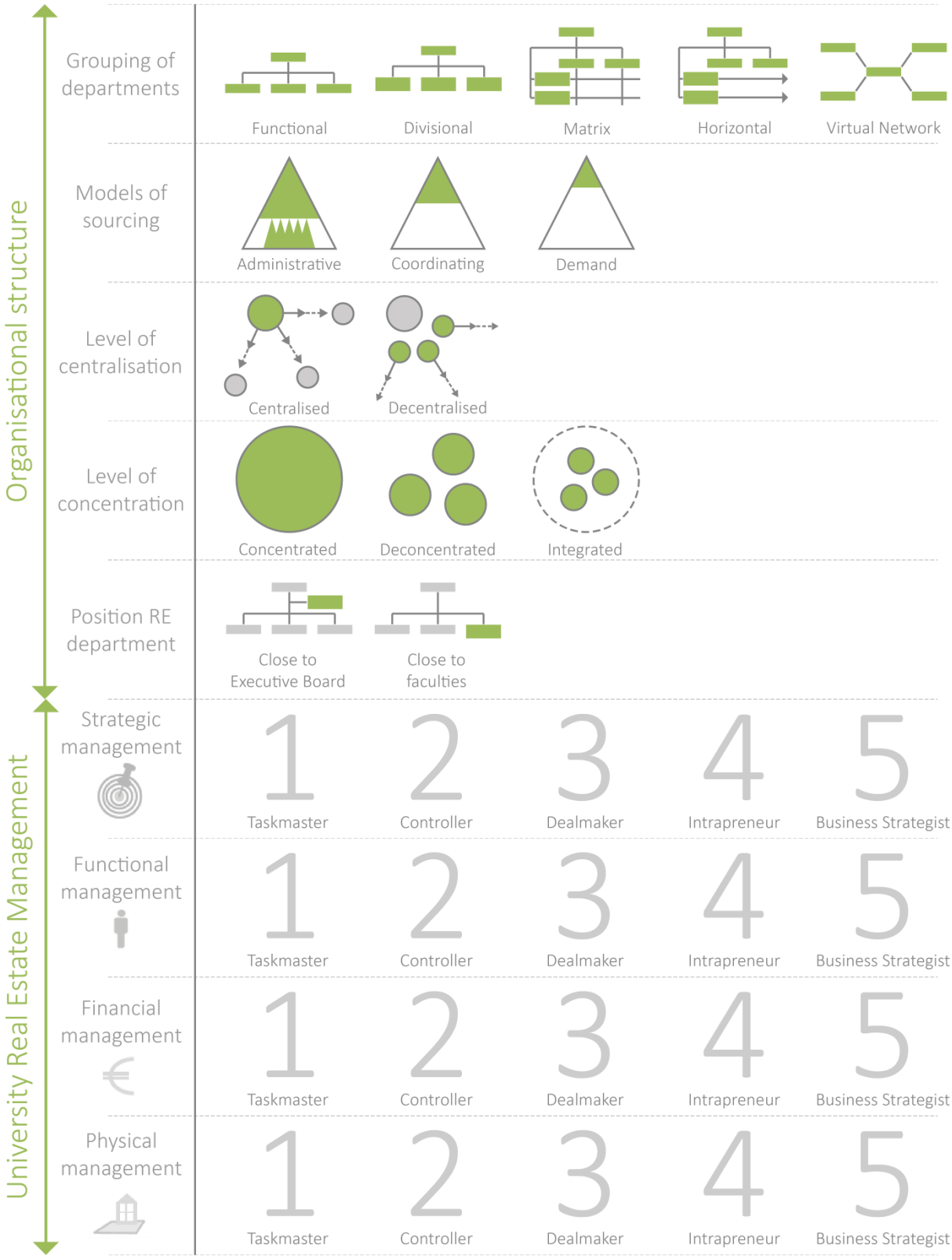


Figure 4.10 – Analytical framework (own illustration)

CAMPUS, WAGENINGEN UNIVERSITY & RESEARCH
PHOTO: WUR

PART 2
DATA COLLECTION & ANALYSES

CHAPTER 5 – ORGANISATIONAL STRUCTURE

In the following chapter, the role of real estate management within the university organisation is analysed using the analytical framework presented in Chapter 4. The first dimension of the framework focuses on the role of real estate management within the university organisation. The role is determined by analysing the organisational structure of the university, the organisational structure of the real estate department, and five structural choices: grouping of departments, level of centralisation, level of concentration, level of sourcing, and position real estate department. In this chapter, only the five structural choices are discussed and compared with general practice. In Chapter 3 and Chapter 4 the general practice for university organisations is elaborated on by discussing different literature. Each section in this chapter starts with an analysis of the organisational structure per university, followed by a discussion of general practice, and ending with a comparison between the two. A more detailed analysis of the organisational structure of all four universities is provided in the Appendices I to IV.

5.1 GROUPING OF DEPARTMENTS

Delft University of Technology (TU Delft)

The real estate department of TU Delft is called *Campus & Real Estate* (*CRE*). The CRE department is the largest support service of TU Delft; the department has approx. 200 to 250 employees (TU Delft, personal communication, July 11, 2019). As can be seen in the organogram in Figure I.2 in Appendix I, CRE is divided into five line departments that are grouped by the different services provided by the department. Thus, the CRE department has a divisional structure: its departments are grouped by products. The services provided by the real estate department can be considered the products of the departments. The products and departments of CRE are (TU Delft, 2019):

- developing the campus strategy and policy for TU Delft, and managing and operating TU Delft's buildings, public areas and facilities *(Strategic Campus Management)*
- developing spatial and real estate management projects *(Campus development)*
- focusing on strengthening the valorisation of TU Delft, and facilitating the needs of the businesses community *(Science Park Development)*
- acquisition, preparation, construction and delivery of real estate projects *(Projects)*
- technical management and maintenance of TU Delft's buildings and grounds *(Maintenance and Management)*

Wageningen University & Research (WUR)

The real estate department of WUR is called *Real Estate & Housing* (*RE&H*), and is part of the Facilities & Services department. According to Mintzberg (1979), a university can be considered a Professional Bureaucracy. In terms of organisational structure and grouping of departments, WUR differentiates itself from general practice: WUR considers itself to be a Machine Bureaucracy (WUR, personal communication, March 22, 2019). According to Mintzberg (1979), the Machine Bureaucracy usually groups its department according to functions. However, the RE&H department has a divisional structure: its departments are grouped by products (WUR, personal communication, March 22, 2019). The different services provided by the real estate department can be considered the products. The products and departments of RE&H are (WUR, personal communication, March 22, 2019):

- maintaining the real estate properties at the lowest cost possible *(Construction & Housing Management)*;
- ensuring compliance with laws and regulations with regard to the built environment, issuing permits, and focusing on sustainability *(Safety & Environment)*;
- focusing on the future development of the existing real estate portfolio, and being responsible for all purchases and sales, and rental agreements *(Real Estate Policy)*;
- doing the real estate administration *(Business Office)*;
- ensuring a 24/7 emergency response, and being responsible for the structural and technical maintenance of the real estate properties *(Technical Installation Management & Construction Services).*

Utrecht University (UU)

As can be seen in the organogram in Figure III.2 in Appendix III, the real estate department – *Corporate Real Estate & Campus* (*CRE&C*) – is divided into three line departments and two staff departments. The two staff departments – Safety & Environment and Finance & Control – are grouped by function. The three line departments are grouped by products, with the products being the different services provided by the real estate department: area development, housing, and strategy, advice and energy. Thus, the real estate department has grouped its departments either by function or by products, depending on it being a line or staff department. To conclude, the CRE&C department has a matrix/hybrid structure: a combination of a divisional and a functional structure.

The products of CRE&C are (UU, n.d.-c; UU, personal communication, April 5, 2019):

- developing the university campuses *(Area Development)*;
- realising housing for education and research *(Housing)*;
- portfolio management on both housing level and area development level: being responsible for updating the Strategic Housing Plan, conducting strategic feasibility studies, asset management, developing new innovations or implementing current trends, and controlling the effectiveness of the real estate portfolio; providing technical advice in the field of installations, sustainability and sustainable innovations; and being responsible for the energy supply on campus *(Strategy, Advice & Energy)*.

The functions of CRE&C are (UU, n.d.-c; UU, personal communication, April 5, 2019):

- security management and sustainability management *(Safety & Environment)*;
- financial management *(Finance & Control)*.

University of Twente (UT)

The real estate department of the University of Twente is called *Maintenance & Real Estate* (*M&RE*), and is part of the central department Campus & Facility Management (UT, personal communication, May 1, 2019). As can be seen in the organogram in Figure IV.3 in Appendix IV, the real estate department is divided into five departments that are grouped by the different services provides by the department. Thus, the real estate department has a functional structure. The real estate functions are as follows (UT, personal communication, May 1, 2019):

- information management
- audio-visual development and management
- housing development
- maintenance
- project management

5.1.1 GENERAL PRACTICE

According to Mintzberg (1979), the structure of the Professional Bureaucracy can be both a functional and a divisional one. Mintzberg (1979) provides an example to prove his point: a university chemistry department can be called functional because they group specialists according to the knowledge, skills and work processes they use, or market-based (*divisional*) because each unit deals with its own unique types of clients (p. 354). The same goes for the real estate department. Thus, the distinction between functional and market bases for grouping breaks down in the Professional Bureaucracy (Mintzberg, 1979, p. 354).

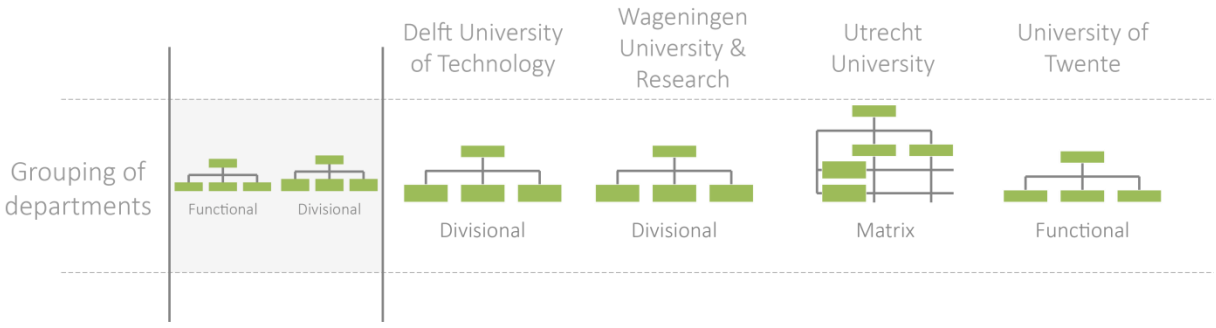


Figure 5.1 – Grouping of departments (own illustration)

Figure 5.1 illustrates the grouping of departments of all four Dutch universities. The figure compares the four universities with general practice. As the figure illustrates, TU Delft and WUR both use a divisional structure, UU uses a matrix structure that combines a divisional and functional structure, and UT uses a functional structure.

According to general practice, a functional/divisional structure is possible for a university organisation. No distinction is made here between a functional and a divisional structure, as this distinction breaks down in a general university organisation (Mintzberg, 1979). The findings of the analysis above correspond with what is found in general practice: the divisional structure of TU Delft and WUR can also be considered a functional structure, and the functional structure of UT can also be considered a divisional structure. The following example will prove this point. The real estate department of TU Delft can be called divisional, because each unit provides its own type of services: for example, developing the campus strategy and policy for TU Delft. However, the real estate department can also be called functional, because the departments are grouped by different knowledge and skills: for example, knowledge and skills related to real estate strategies and policy. The UU uses a matrix organisation: a combination of a divisional and a functional structure. The same goes for this type of structure; the divisional departments can also be considered functional departments, and the functional departments can also be considered divisional departments.

5.2 LEVEL OF CENTRALISATION

Delft University of Technology (TU Delft)

All real estate related decisions are made by the real estate department of TU Delft (TU Delft, personal communication, February 25, 2019; TU Delft, personal communication, April 29, 2019). The CRE department is part of the University Corporate Office, which takes a central place in the organisation. Every faculty also has its own real estate department that is part of the faculty's support services. These real estate departments support all building related matters at faculty level. However, the departments have no decision-making authority (TU Delft, personal communication, April 29, 2019). Thus, TU Delft has a *centralised* real estate decision-making structure.

Wageningen University & Research (WUR)

Wageningen University & Research has one central real estate department – Real Estate & Housing – which is part of the Facilities & Services department. The organisational units do not have a real estate department as part of their support services (WUR, personal communication, March 22, 2019). The organisational units do have a location manager that is concerned with their real estate (WUR, personal communication, March 22, 2019). However, these location manager work for the central Facilities & Services department (WUR, personal communication, March 22, 2019), which means that the organisational units have no real estate decision-making authorities. Thus, all real estate decisions are made by the central real estate department. Therefore, WUR has a *centralised* real estate decision-making process.

Utrecht University (UU)

Utrecht University has a central real estate department – Corporate Real Estate & Campus – which is part of the University Corporate Office. All real estate decisions are made by the central CRE&C department (UU, personal communication, April 5, 2019). UU does not have real estate departments at faculty level; however, each faculty has its own demand manager that coordinates the housing of its faculty (UU, personal communication, April 5, 2019). The demand manager does not have any decision-making authority (UU, personal communication, April 5, 2019). Therefore, UU has a *centralised* real estate decision-making process.

University of Twente (UT)

University of Twente has a central real estate department – Maintenance & Real Estate – which is part of the Campus & Facility Management department. The faculties do not have a real estate department as part of their supporting services (UT, personal communication, May 1, 2019), which means that the faculties have not decision-making powers regarding their housing. Therefore, UT has a *centralised* real estate decision-making process.

5.2.1 GENERAL PRACTICE

Since universities are a strongly decentralised organisations, it seems logical to decentralise the responsibilities and accountability of the real estate decision-making process. The faculties have an independent and autonomous position in the organisation, and will therefore expect some control over their housing; after all, they know best what is needed for education and research (Bank & den Heijer, 2004). Decentralisation will also create more cost awareness among the faculties (Bank & den Heijer, 2004). However, a centralised real estate decision-making process can also be observed within universities. It is increasingly emphasized that the institutional objectives are more important than the individual organisational units' (Bank & den Heijer, 2004) At the same time, the limited financial resources have placed a greater emphasis on efficiency (Bank & den Heijer, 2004). With regard to these latter developments, it would be logical to centralise the real estate decision-making process, so real estate can be aligned with institutional objectives and goals (Bank & den Heijer, 2004). Both a centralised and a decentralised real estate decision-making process is thus possible.

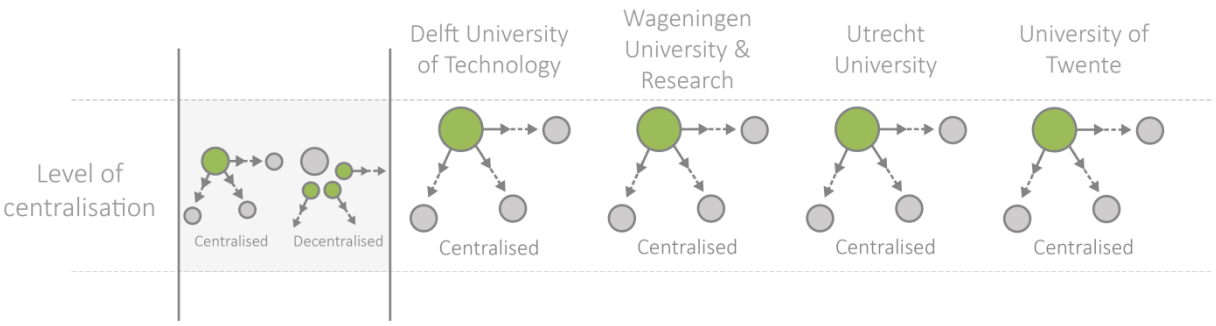


Figure 5.2 – Level of centralisation (own illustration)

Figure 5.2 illustrates the level of centralisation of all four Dutch universities. The figure compares the four universities with general practice. All four universities have chosen to centralise their real estate decision-making process, and place the responsibilities, accountability and decision-making powers within a central real estate department.

According to general practice, both centralisation and decentralisation is possible within university organisations. The findings described above are in line with general practice. Considering the focus on institutional objectives and goals, and the limited financial resources of Dutch universities, it seems logical that all four universities have a centralised decision-making process. However, WUR has a strong focus on reducing costs and providing real estate management services at the lowest costs possible, which is generally not associated with centralisation. According to general practice, decentralisation contributes to reducing costs by efficient use of space. Thus, considering the strong focus of WUR on reducing costs, it would also be logical to choose a decentralised decision-making process.

5.3 LEVEL OF CONCENTRATION

Delft University of Technology (TU Delft)

In addition to the central Campus & Real Estate department, TU Delft has real estate departments at faculty level, which are part of the faculties' support services (TU Delft, personal communication, February 25, 2019). The real estate services at faculty level are responsible for the operational management of the faculties' real estate, which includes maintenance of technical installations and building facilities, providing a sustainable building, and making sure the building is safe (TU Delft, 2019; TU Delft, personal communication, April 29, 2019). To conclude, the operation of real estate activities is *deconcentrated*.

Wageningen University & Research (WUR)

Wageningen University & Research has a central real estate department at university level, and several location managers at faculty level (WUR, personal communication, March 22, 2019). The faculty does not have a real estate department as part of its support services (WUR, personal communication, March 22, 2019). Thus, the central real estate department is responsible for all real estate related tasks: decision-making and operation. The location managers are employed at the Facilities & Services department and are delegated to the organisational units (WUR, personal communication, March 22, 2019). The Facilities & Services department is responsible for all support services of the university, such as IT, operational services, and real estate. The location manager is responsible for the organisational unit's support services (WUR, personal communication, March 22, 2019). Thus, the location manager does not solely focus on real estate services, but on all support services. Therefore, the department Facilities & Services can be considered a *shared service center*, in which all support services are *integrated*. To conclude, the operation of the real estate activities is concentrated in a shared service center.

Utrecht University (UU)

Utrecht University has a central real estate department at university level that is responsible for all real estate related issues (UU, personal communication, April 5, 2019). At faculty level, the organisational units have a demand manager that is concerned with the units' real estate and facility services (UU, personal communication, April 5, 2019). The demand managers work for the faculties; however, their tasks are centrally regulated by CRE&C (UU, personal communication, April 5, 2019). Therefore, UU has *concentrated* its real estate activities in a central place in the organisation

University of Twente (UT)

The central Campus & Facility Management department of WUR is responsible for all campus related services, including real estate management (UT, personal communication, May 1, 2019). The operation of real estate activities is concentrated in the Management & Real Estate department (UT, personal communication, May 1, 2019). The faculties are not responsible for the operation of their real estate activities department (UT, personal communication, May 1, 2019). Thus, UT has *concentrated* its real estate activities in a central place in the organisation.

5.3.1 GENERAL PRACTICE

The general practice for concentrating real estate activities within university organisations is the same as the general practice for centralising real estate decision-making powers. Since the faculties of universities are strongly decentralised organisational units, it would be logical to deconcentrate real estate activities (Bank & den Heijer, 2004). Deconcentration will contribute to a better alignment between real estate products and the primary process (Bank & den Heijer, 2004). Concentrated real estate activities can also be observed within university organisations. Concentrated real estate activities will help achieve economies of scale, and will strengthen the corporate identity of the university (Bank & den Heijer, 2004). Both concentrated and deconcentrated real estate operation is thus possible.

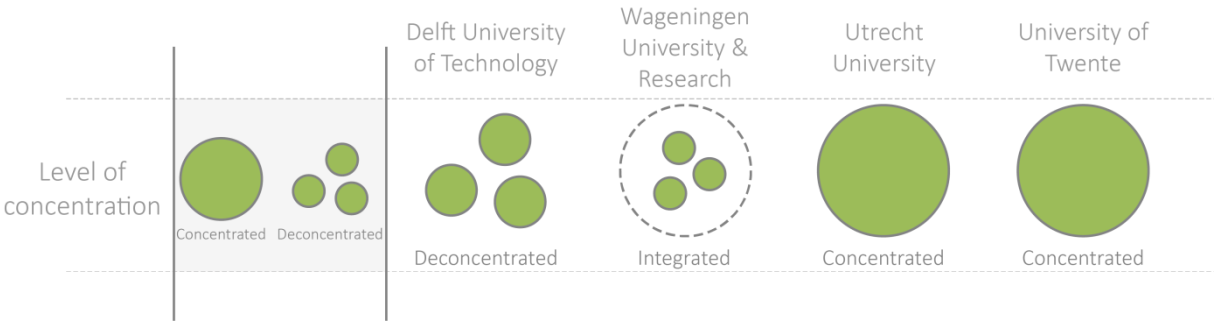


Figure 5.3 – Level of concentration (own illustration)

Figure 5.3 illustrates the level of concentration of all four Dutch universities. The figure compares the four universities with general practice. As the figure illustrates, TU Delft has chosen to deconcentrate its real estate activities; WUR has decided to combine the operation of its real estate activities with the other supporting services activities, and integrate them into a shared service center; UU and UT have chosen to concentrate the operation of its real estate activities in a central place.

As shown in the figure, both concentrated and deconcentrated real estate activities are seen in Dutch university organisations (Bank & den Heijer, 2004). The findings of the analysis above correspond with what is seen in general practice: TU Delft has deconcentrated real estate activities, and UU and UT have concentrated their real estate activities. WUR has a shared service center where all support services are integrated. WUR decided to create a central Facilities & Services department – the shared service center – to provide all support services in a similar matter, and thereby achieve economies of scale. This also contributes to WUR's focus on providing real estate services at the lowest cost possible.

5.4 LEVEL OF SOURCING

Delft University of Technology (TU Delft)

The Campus & Real Estate department outsources certain operational real estate activities. The outsourced activities concern only technical management and maintenance activities, which are the responsibility of the Maintenance & Management department (TU Delft, personal communication, February 25, 2019). The Maintenance & Management department manages the outsourced activities, and an external service provider is responsible for the execution of the activities (TU Delft, personal communication, February 25, 2019). To conclude, only certain operational management activities are outsourced, while all strategic and tactical activities are kept in-house, which means that CRE has an *administrative* organisation.

Wageningen University & Research (WUR)

The Real Estate & Housing department outsources certain operational real estate activities to external service providers (WUR, personal communication, March 22, 2019). The real estate department takes on a directing role towards its outsourced activities, while the external party is responsible for the execution of the activities (WUR, personal communication, March 22, 2019). To conclude, only certain operational management activities are outsourced, while all strategic and tactical activities are kept in-house, which means that RE&H has an *administrative* organisation.

Utrecht University (UU)

The real estate department hires external service providers for certain real estate activities (UU, personal communication, April 5, 2019). However, real estate activities are never completely outsourced (UU, personal communication, April 5, 2019). The outsourced activities only include operational management tasks; for example, when there is a lack of personnel or lack of knowledge and expertise (UU, personal communication, April 5, 2019). To conclude, only certain operational activities are outsourced, while all strategic and tactical activities are kept in-house, which means that CRE&C uses an *administrative* model for sourcing.

University of Twente (UT)

The Maintenance & Real Estate department outsources several real estate activities (UT, personal communication, May 1, 2019). All strategic and most tactical activities are kept in-house (UT, personal communication, May 1, 2019). At the operational level, all management and maintenance activities are outsourced to several external parties (UT, personal communication, May 1, 2019). The real estate department only has contract managers who manage the contracts with these parties (UT, personal communication, May 1, 2019). Thus, Maintenance & Real Estate uses an *coordinating* model for sourcing its real estate activities

5.4.1 GENERAL PRACTICE

In 2008, a study was conducted on outsourcing real estate management in the Dutch public real estate portfolio (Janssen, 2008). The research studied several Dutch companies and public organisations, including several research universities and universities of applied sciences (Janssen, 2008). At the strategic and tactical level, the universities keep all real estate activities in-house, and sometimes are assisted by external parties for their expertise (Janssen, 2008). As the university real estate management process is a complex process and a specific field of knowledge, external service provides most often do not have such specific knowledge and skills (Janssen, 2008). At the operational level, several real estate activities are outsourced by the universities, such as planned maintenance, and technical and facility management activities (Janssen, 2008). Some universities decided to outsource all operational management activities, and take on a coordinating role towards the outsourced activities (Janssen, 2008). Thus, both an administrative model and a coordinating model are seen in general practice.

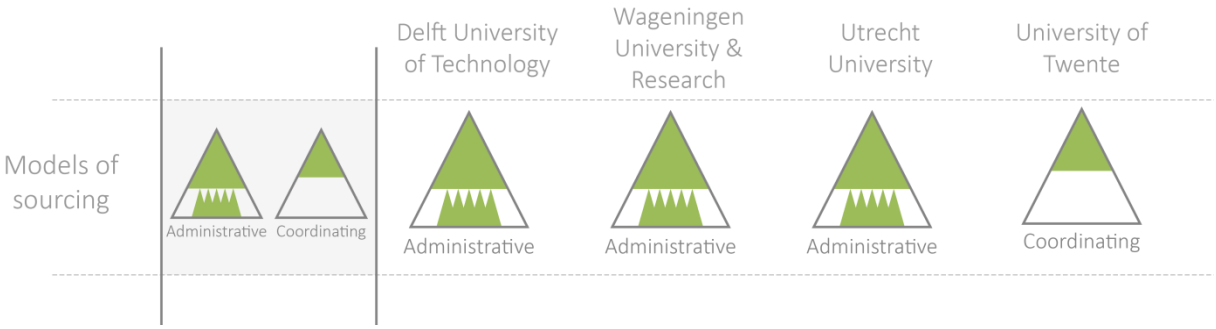


Figure 5.4 – Level of sourcing (own illustration)

Figure 5.4 illustrates the level of sourcing of all four Dutch universities. The figure also compares the four universities with general practice. TU Delft, WUR and UU use an administrative model for sourcing their real estate activities, and UT uses a coordinating model.

According to general practice, the administrative model is mostly used by Dutch university organisations; however, a coordinating model is not uncommon either (Janssen, 2008). The findings presented in Figure 5.4 are in line with general practice. Considering the unique and complex portfolios of the Dutch universities, it seems logical that all four universities keep the strategical and tactical management activities in-house. Although it is not uncommon, UT has chosen to outsource its operational management tasks completely, together with some of its tactical management tasks.

5.5 POSITION REAL ESTATE DEPARTMENT

Delft University of Technology

The Campus & Real Estate department has little decision-making powers and needs approval from the Executive Board for larger decisions (TU Delft, personal communication, February 25, 2019). The decision-making authority of the real estate department is determined by two things: the Mandate Regulations of TU Delft and the investments costs of the real estate intervention (TU Delft, personal communication, February 25, 2019). The little decision-making authority and need for approval of the Executive Board indicate a high position of the real estate department; *close to the Executive Board*.

Wageningen University & Research

The real estate department has little decision-making authority and needs approval from either the director of the Facilities & Services department or from the Executive Board for larger financial decisions (WUR, personal communication, March 22, 2019). The RE&H department has two reporting lines: one short line to the director of Facilities & Services, and one to the Executive Board for larger and more complex decisions (WUR, personal communication, March 22, 2019). The little decision-making authority and the need for approval of the director of Facilities & Services and the Executive Board indicate a high position of the real estate department; *close to the Executive Board*.

Utrecht University

The Corporate Real Estate & Campus department has little decision-making powers and needs approval from the Executive Board for larger decisions (UU, personal communication, April 5, 2019). The decision-making authority of the real estate department is determined by the Mandate Regulations of UU and the investment costs of the real estate projects (UU, personal communication, April 5, 2019). The little decision-making authority and need for approval of the Executive Board indicate a high position of the real estate department; *close to the Executive Board.*

University of Twente

The real estate department has little decision-making powers and needs approval from the Executive Board for larger decisions. The decision-making process consists of three levels: a program team Real Estate, a steering committee Real estate, and the Executive Board (UT, personal communication, May 1, 2019). The program team proposes real estate plans and policies to the steering committee; the steering committee then decides, or in case of larger and more complex decisions the Executive Board decides. The little decision-making authority and the need for approval of the steering committee Real Estate and the Executive Board indicate a high position of the real estate department; *close to the Executive Board*.

5.5.1 GENERAL PRACTICE

A position close to the Executive Board is advisable when a real estate department has little mandate and needs approval from the Executive Board for larger financial decisions (Bank & den Heijer, 2004). A position close to Executive Board ensures that the real estate department is well aware of the institutional objectives and goals, and can align the real estate policy accordingly (Bank & den Heijer, 2004). A high position in the organisation is mostly seen in general practice (Bank & den Heijer, 2004). However, in some cases a position close to the faculties is advisable. A position close to the faculties ensures a close distance between the real estate department and the users, and helps aligning the real estate services with the primary process (Bank & den Heijer, 2004). In this case, the real estate department operates as a business unit with the users being its customers (Bank & den Heijer, 2004). To conclude, both a high and low position of the real estate department is possible, but a low position close to the faculties is uncommon.

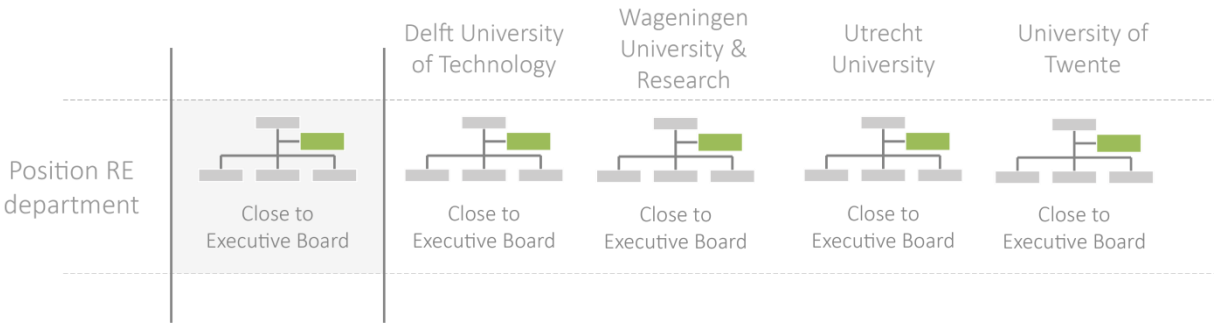


Figure 5.5 – Position real estate department (own illustration)

Figure 5.5 illustrates the position of the real estate department of all four Dutch universities. The figure also compares the four universities with general practice. All four universities have chosen to place the real estate department close to the Executive Board.

According to general practice, a low position is only advisable when the real estate department has large decision-making authority (Bank & den Heijer, 2004). The findings of the analysis above correspond with what is seen in general practice: all universities have a real estate department positioned close to the Executive Board. Considering the little decision-making authority and the need of approval from higher levels in the organisation, it seems logical that the universities have chosen a high position.

5.6 CONCLUSION

The organisational structure of the real estate department of all four Dutch universities are analysed by using the analytical framework presented in Chapter 4. A more detailed analysis of the organisational structure of the universities can be found in Appendices I to IV. Figure 5.6 visualises the result of the analysis. The four Dutch universities are compared to general practice, which is also represented in Figure 5.6. All findings of the analysis are in line with what is found in general practice.

It should be noted that the analytical framework does not always give a fair representation of reality. In practice, the organisational structure of an organisation is much more complex, and is determined by structural choices other than the five that are included in the framework, and by other organisational aspects. Therefore, the analysis in text in Appendices I to IV provide a more nuanced representation of the organisational structure of the four universities.

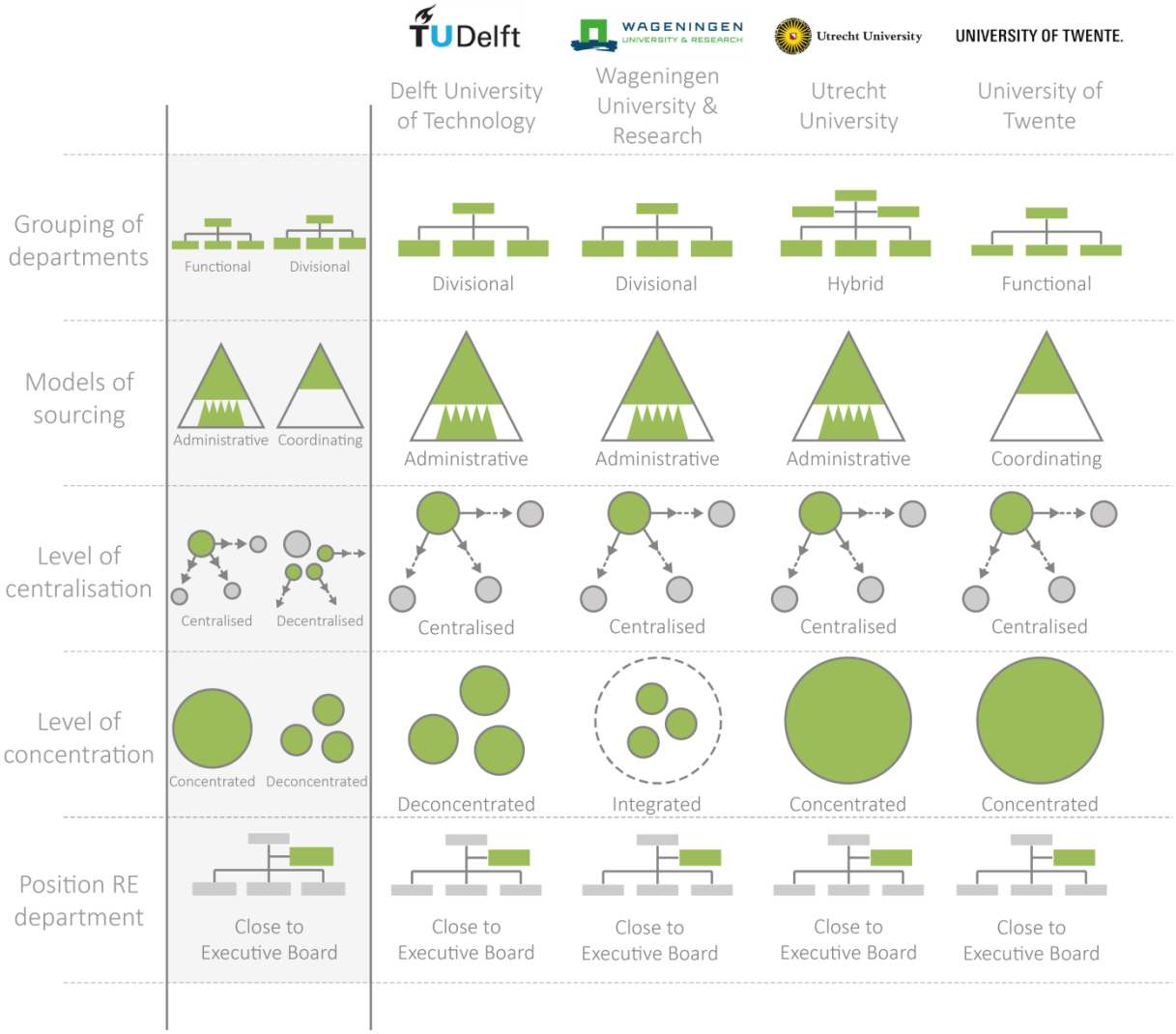


Figure 5.6 – Analysis of the organisational structure of the four Dutch universities (own. illustration)

CAMPUS, DELFT UNIVERSITY OF TECHNOLOGY
PHOTO: TU DELFT

CHAPTER 6 – DELFT UNIVERSITY OF TECHNOLOGY

6.1 INTRODUCTION

Delft University of Technology, also known as TU Delft, is the largest and oldest Dutch technology university, and is one of the world's top universities. With eight faculties and numerous research institutes, TU Delft accommodates over 24.000 students, 3.400 scientists and 2.300 support and management staff (VSNU, 2018). TU Delft was founded in 1842, and got full university rights in 1905. The current name, Delft University of Technology, was established in 1986. TU Delft has the second largest campus of all Dutch universities, and comprises a diverse portfolio of 60 buildings occupying over 600.000 square meters gross floor area in 161 hectares of land (TU Delft, 2018c, p.16). Most of the university buildings were constructed between the 1950s and 1970s (den Heijer, 2011). The real estate department of TU Delft is called Campus & Real Estate. Table 6.1 presents facts and figures of Delft University of Technology.

Education	
Bachelor programmes	16
Master programmes	32
Student population	24.508
PhD students	2.799
First year student	5.519
Master degrees	3.137
Research	
Professors (FTE)	253
Publications	6.317
Promotions	359
Valorisation	
Techno start-ups	23
Patents in portfolio	215
Personnel	
Scientific staff (FTE)	3.068
Scientific staff (headcount)	3.447
Supporting staff (FTE)	2.083
Supporting staff (headcount)	2.376
Finances	
Government funding	464,5 M€
Indirect funding	52,5 M€
Contract funding	143,2 M€

Table 6.1 – Facts and figures Delft University of Technology 2017 (TU Delft, 2018a; TU Delft, 2018b)

Figure 6.1 – Logo's Delft University of Technology (left: old logo, right: current logo (https://www.tudelft.nl/huisstijl/logo/)

Figure 6.2 – Campus TU Delft (TU Delft, 2018c)

6.2 ORGANISATIONAL STRUCTURE

TU Delft's organisational structure is discussed in Chapter 5. An detailed analysis of the organisational structure can be found in Appendix I.

6.3 UNIVERSITY REAL ESTATE MANAGEMENT

TU Delft's real estate management process is analysed in the following section by using the analytical framework discussed in Chapter 4. TU Delft's real estate management process is assessed by the development stage of the real estate department – *task manager, controller, dealmaker, intrapreneur,* and *business strategist* – from each CREM perspective – *strategic, functional, financial,* and *physical*.

6.2.1 STRATEGIC PERSPECTIVE

Communication and collaboration with Supervisory Board and Executive Board

The relevant stakeholders from the strategic perspective are the policymakers of the organisation (den Heijer, 2011). In the case of a university, the policymakers are the members of the Supervisory Board and the Executive Board. Both the Supervisory Board and the Executive Board of TU Delft are well involved with the real estate department, and are aware of the importance of real estate for their organisation (TU Delft, 2018a; TU Delft, personal communication, February 25, 2019; TU Delft, personal communication, April 29, 2019).

In 2017, the Supervisory Board created a new position within the Executive Board: Vice-President for Operations (TU Delft, 2018a; TU Delft, personal communication, April 29, 2019). The creation of the position was motivated by the increasing importance of and attention for internal management (TU Delft, 2018a, p. 132). TU Delft (2018a) also states that the complexity and long turnaround time of the university's real estate challenge, the associated risks for the university, and the need to retain the priority of the primary processes, was another reason for the Supervisory Board to consider it desirable to design the portfolio in such a way that internal operations demand the full attention and care of a single Board member (p. 132). Thus, by creating a this new position, one single person can focus on the complex real estate portfolio, which proves the senior management of TU Delft is concerned with its real estate portfolio and the associated challenges.

The real estate department communicates regularly with the Supervisory Board and Executive Board. Twice a year, bilateral meetings are held with the Executive Board, the director of the University Corporate Office department and the directors of the individual departments of the University Corporate Office (TU Delft, 2018a; TU Delft, personal communication, February 25, 2019). During these two meetings, which take place during spring and autumn, all real estate related issues are discussed with the board members. During the bilateral spring meeting results of the previous year are discussed, and during the bilateral autumn meeting new plans for the upcoming year are presented (TU Delft, personal communication, February 25, 2019). The real estate department also discusses real estate related issues each quarter during the meeting with the Supervisory Board (TU Delft, 2018a). The regular communication between Campus and Real Estate and TU Delft's senior management is important for the conformity of real estate plans and the university's strategic plans.

Strategic focus

The strategic focus of Campus & Real Estate is visible in the real estate plans. The strategic plans made by the university are the starting point for the real estate plans (TU Delft, personal communication, February 25, 2019). The university expresses its ambitions through its strategic plans, and the real estate department tries to match the real estate plans to these strategic plans. The latest plan made by the university is the Strategic Framework 2018-2024. The most important real estate plan is the real estate strategy. The current real estate strategy covers multiple years and has an lont-term planning; the strategy is designed for the period 2016-2025 (TU Delft, personal communication, February 25, 2019). The strategy expresses which real estate interventions will be carried out in the coming years (TU Delft, personal communication, February 25, 2019). Every real estate decision is assessed against the real estate strategy (TU Delft, personal communication, February 25, 2019). To conclude, the real estate strategy is an example of a future strategic plan that is focused on continuous improvement of the real estate portfolio.

In 2017, the university decided to change the organisational structure of TU Delft (TU Delft, personal communication, April 29, 2019; TU Delft, n.d.). Strategic considerations for changing the structure of the organisation include the growing student numbers, TU Delft's complex real estate challenges, the provision of transparent management of the support services, and boosting international recognisability (TU Delft, 2018a, p. 76). One of the changes in the organisational structure is the separation of facility management and real estate management (TU Delft, personal communication, April 29, 2019). Previously, real estate management was grouped together with facility management: Facility Management and Real Estate (FMRE). The reason behind the separation of these two services was to have one single department that can focus entirely on these complex real estate challenges (TU Delft, personal communication, April 29, 2019). The creation of a single department concerned with real estate management proves that TU Delft's senior management thinks on a strategical level about its real estate management process and its organisation structure.

To conclude, TU Delft's real estate department can be positioned at the *Business Strategist* stage of the five development stages of Joroff et al. (1993). Considerations underlying the determination of this development stage include the involvement of senior management, and the presence of long-term strategic plans.

6.2.2 FUNCTIONAL PERSPECTIVE

Communication and collaboration with faculties

The most important users of university real estate are the faculties. The real estate department develops the real estate plans together with the faculties (TU Delft, personal communication, February 25, 2019). The faculties discuss their real estate demands and wishes with Campus & Real Estate, and Campus & Real Estate collects the user demands and analyses user satisfaction (TU Delft, personal communication, April 29, 2019). The real estate department finds it essential to be aware of user demands and user satisfaction, because this supports the real estate department in aligning the real estate portfolio with the primary process.

Each faculty has its own real estate department, which is responsible for the building management of their faculty's real estate (TU Delft, personal communication, April 29, 2019). Each faculty has different types of spaces and also different demands, which is why TU Delft chooses to deconcentrate its real estate activities (TU Delft, personal communication, April 29, 2019). Since the faculty's primary process is education and research, it is beneficial to have a real estate department at faculty level; this department can be solely concerned with its faculty's real estate. The real estate department at faculty level therefore makes communication and collaboration between the faculties and the real estate department easier and more efficient. Easier and efficient communication and collaboration helps to align the real estate portfolio with user demands, and increases user satisfaction, and thereby better supports the primary process.

Another important concept related to communication and collaboration with the faculties is co-creation. The real estate department encourages co-creation in the development of the campus (TU Delft, 2018d; TU Delft, personal communication, May 15, 2019). The real estate department wants to create awareness among the faculties, and enable them to contribute to real estate solution by stimulating a sense of ownership (TU Delft, personal communication, May 15, 2019).

Anticipating on trends

The CRE department closely monitors the trends in society that impact the university (TU Delft, 2018a). The increasing student number is one of these trends, and has a significant impact on the university (see Figure 6.3). Before, the university presumed that the student numbers would reach 25.000 by 2025 (TU Delft, 2018a). However, the increase in student numbers is occurring more rapidly than expected; the number of students is expected to exceed 25.000 by 2020 (TU Delft, 2018a). While the student numbers are increasing, the amount of square meters of study spaces is not (TU Delft, 2018a). The real estate department anticipates on this trend, and has made plans to increase the number of square meters (TU Delft, 2018a). The real estate department is creating more study places throughout the campus, two examples of this are the new Pulse building (completed in 2018) and Echo building (to be completed in 2021) (TU Delft, 2018a).

	2017	2018	2019	2020	2021	2022
student numbers	22.500	23.500	23.900	24.400	24.900	25.300

Figure 6.3 – Expected student numbers (TU Delft, 2018a)

To conclude, Campus and Real Estate can be positioned at the *Business Strategists* stage of the five development stages of Joroff et al. (1993). Considerations underlying the determination of the position include the integration of user demands and user satisfaction into the real estate plans, and the anticipation on trends, as discussed above.

6.2.3 FINANCIAL PERSPECTIVE

Financial controllers

The relevant stakeholders from the financial perspective are the financial controllers of the university (den Heijer, 2011). TU Delft has a central Finance department, which is part of the University Corporate Office. The Finance department is responsible for developing the financial strategy and policy of TU Delft (TU Delft, 2018a). The CRE department has its own Finance department that focuses on the financial aspects of TU Delft's real estate, like financial value, risks and costs (TU Delft, personal communication, February 25, 2019). CRE's financial department manages the housing activities of TU Delft and ensures healthy finances (TU Delft, 2019). The department also provides information on business economics aspects for controlling TU Delft's real estate costs (TU Delft, 2019). The financial department of CRE works closely together with the central Finance department (TU Delft, personal communication, February 25, 2019).

Financial tools and systems

The real estate organisation of TU Delft does not charge the faculties for their housing (TU Delft, personal communication, April 29, 2019). With its current real estate challenge, the focus is on reducing space drastically and moving to monofunctional buildings rather than each faculty having its own building (TU Delft, personal communication, April 29,

2019). To make this reduction possible, and avoid discussion, the real estate department has chosen to not charge the faculties anymore (TU Delft, personal communication, April 29, 2019). The real estate department does discuss the real estate costs and the efficiency of space use with the users, and reports this to the Executive Board (TU Delft, personal communication, April 29, 2019). This way, the faculties and the real estate organisation are both aware of the actual space use and how to improve the efficiency.

The university creates the financial budget for the whole university, including the real estate budget (TU Delft, personal communication, February 25, 2019). The real estate department has an influence on this budget (TU Delft, personal communication, April 29, 2019). The real estate department designs real estate plans, and calculates the budget that is required to implement these plans (TU Delft, personal communication, April 29, 2019). The real estate department has its own financial department that sets up financial reports, and matches these reports to the institutional reports (TU Delft, personal communication, April 29, 2019). The department presents these plans to the Executive Board (TU Delft, personal communication, April 29, 2019). The financial department is also responsible for project control (TU Delft, personal communication, February 25, 2019). TU Delft has a relatively expensive real estate portfolio; because it consists of outdated buildings, and it is a large portfolio that requires large investments (TU Delft, personal communication, April 29, 2019).

To conclude, Campus and Real Estate can be positioned at the *Intrapreneur* stage of the five development stages of Joroff et al. (1993). Considerations underlying the determination of the position include the financial tool, such as long-term financial plans and the financial budget, the presence of a financial department within the real estate department, and awareness of financial value, risks and costs of TU Delft's real estate. The real estate department acts as a profit center; it focuses not only on reducing real estate costs, but also focuses on creating high quality real estate properties that match the user demands.

6.2.4 PHYSICAL PERSPECTIVE

Awareness of physical aspects real estate

The real estate department assesses the physical condition of TU Delft's real estate regularly (TU Delft, personal communication, February 25, 2019). The real estate department uses the assessment method NEN 2767 for its condition assessments (TU Delft, personal communication, February 25, 2019). All TU Delft buildings are kept in condition score 2, 3 or 4, which is moderate to good (TU Delft, personal communication, February 25, 2019). TU Delft buildings only have a condition score of 5 or 6 when the real estate department is going to dispose the buildings (TU Delft, personal communication, February 25, 2019). Once it is known that a building will be disposed of, the real estate department will stop maintaining it; the building will then slowly deteriorate into condition level 5 or 6 (TU Delft, personal communication, February 25, 2019).

The real estate department also creates long-term maintenance plans (TU Delft, personal communication, February 25, 2019). The maintenance plans describe which TU Delft buildings or building components will be replaced or renovated, and when (TU Delft, personal communication, February 25, 2019). Which real estate interventions will be taken and when depends on a number of variables (TU Delft, personal communication, February 25, 2019). One of the most important variables is discussed above; the physical condition of TU Delft's real estate (TU Delft, personal communication, February 25, 2019). Other relevant variables are for example book value and user demands (TU Delft, personal communication, February 25, 2019). In 2017, the maintenance strategy has been revised to better align it with the real estate strategy (Technische Universiteit Delft, n.d.). In the revised maintenance plans a differentiation is made in the level of maintenance for the different types of properties (TUD, n.d.).

Sustainable development

TU Delft has high sustainability ambitions for its real estate. Figure 6.4 presents CRE's objectives related to sustainable development.

The CRE department has translated these objectives into several plans (TUD, n.d.). The university is currently developing a roadmap how TU Delft can switch to sustainable energy resources and a CO_2-neutral campus (TUD, n.d.). In addition, a vision for sustainability has been drawn up, which imbeds sustainability into the current and future real estate developments and projects (TUD, n.d.). The real estate department also proposes sustainable and innovative solutions when constructing new properties and renovating projects (TU Delft, 2018e). The proposed solutions are in line with the department's ambitions. The educational building Pulse is a good example; the building is the first energy neutral building in TU Delft's real estate portfolio (TU Delft, 2018e). Campus & Real Estate also invest in buildings in such a way that they are adaptable to future developments in educations and research (TU Delft, 2018d).

To improve on sustainable development, the university closely monitors the energy consumption of its real estate portfolio (TU Delft, n.d.-b). TU Delft collects data on energy consumption and makes it available to everyone through an online energy

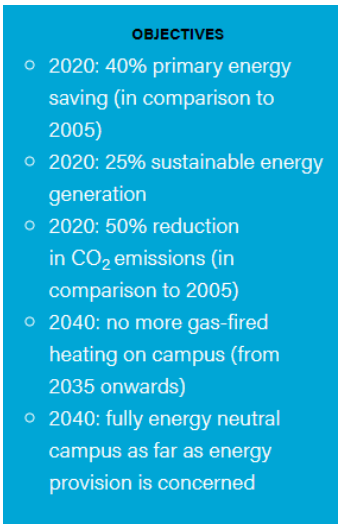


Figure 6.4 – Campus & Real Estate objectives related to sustainable development (TU Delft, 2018e)

monitor (TU Delft, n.d.-b). Through this energy monitor, the university monitors the consumption of electricity, gas, water, heat, and the production of CO_2 emissions. TU Delft uses the information provided by the monitor to reduce the consumption of these sources (TU Delft, n.d.-b). Figure 6.5 provides an overview of the energy monitor for gas consumption in the year 2018.

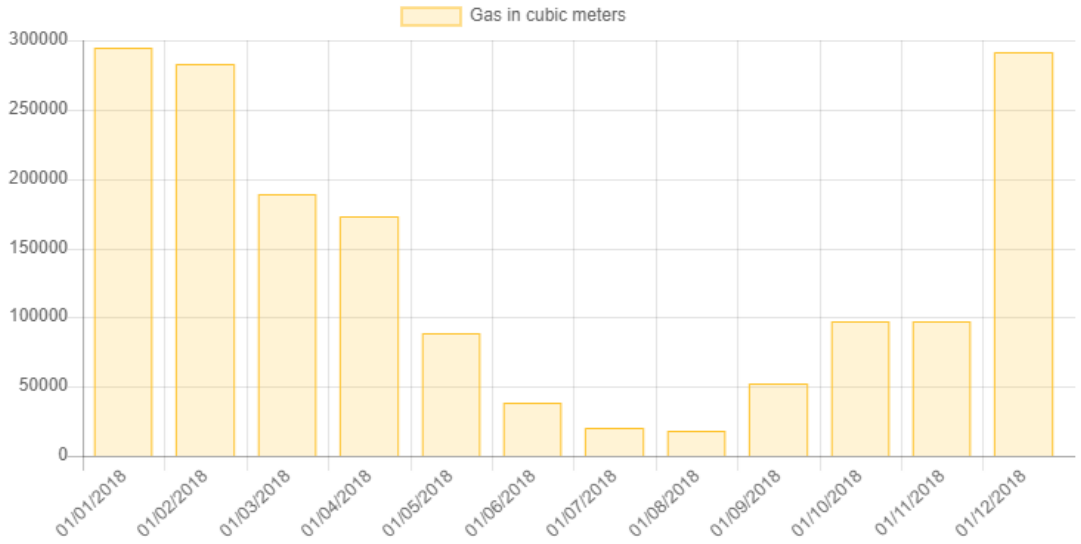


Figure 6.5 – Energy monitor: Gas (http://emonitor.tudelft.nl/index.php/campus/)

To conclude, Campus and Real Estate can be positioned at the fifth development stage of Joroff et al. (1993): the *Business Strategist* stage. TU Delft does have sustainable ambitions for the coming years, however, the ambitions are not made explicit in plans. CRE monitors and analyses TU Delft energy performance, and proposes innovative and sustainable solutions.

6.2.5 ASSESSMENT UNIVERSITY REAL ESTATE MANAGEMENT

Table 6.4 summarises the analysis of Delft's real estate management process.

	Strategic	Functional	Financial	Physical
	aligning real estate with institutional goals	aligning real estate with (primary) processes	aligning real estate financial value, risks and costs with production of products and services	maintaining quantity and quality of current and future real estate
Task manager	* supply in university's demand for real estate * senior management is involved with real estate department	* supply in faculties' demand for real estate * real estate enables students and researchers to produce knowledge	* supply in demand for real estate within budgets * real estate is viewed as neither a cost nor benefit	* supply in demand for real estate * provide general service on real estate as needed * corrective maintenance
Controller	* real estate department reports results to the senior management * presence of statements related to strategic goals, but not made explicit in plans	* physical environment optimal for primary process * analyses of primary processes * interaction and dialogue with faculties about their short- and long-term needs	* supply in demand for real estate at the lowest cost possible * awareness of potential costs and benefits of real estate * control and minimize real estate costs * analytical focus	* awareness of technical building costs * reducing square meters * presence of statements related to sustainability goals, but not made explicit in plans
Dealmaker	* strategic focus is made explicit in plans * real estate department communicates regularly with senior management * real estate department behaves proactively and comes up with new ideas	* physical environment optimal for faculties * analyses of user satisfaction * real estate department works together with faculties to identify the optimal space needs * standardisation real estate usage	* presence of financial tools and systems * balancing real estate costs against increasing costs of primary process * internal costing of real estate costs * analysing and documenting sources of market value	* basic inventory routines on real estate * focus on sustainability is made explicit in plans * analysis of physical aspects real estate portfolio * presence of maintenance plans * preventive maintenance
Intrapreneur	* full implementation or ongoing execution of strategic plans * long-term strategic planning * real estate department works closely together with senior management * matching the real estate department's strategy to its competitors' * real estate department coordinates plans with other support services	* overview of space use * overview of occupancy rates and frequency rates of real estate * real estate department works closely together with faculties and is involved in faculties' strategic planning processes * proposing real estate data and alternatives to faculties	* balancing real estate costs against optimising and increasing productivity * proving importance real estate through measurable results * real estate department acts as profit center * presence of financial controllers within the real estate department * long-term financial planning * scenario and risk planning	* full implementation or ongoing execution of sustainability plans * full implementation or ongoing execution of maintenance plans * proposing innovative and sustainable solutions * overview of real estate's energy performance * long-term maintenance planning
Business strategist	* generating future strategic plans for continuous improvement * high frequency of revising and adjusting real estate plans to match the changing demands * anticipating on trends, measuring and monitoring their impacts and contributing to the direction of the university as a whole * real estate department is closely aligned with senior management * real estate adds value to institutional goals and thereby improves the competitive advantage	* generating future plans to improve space use and thereby maximise efficiency * a state of the art learning and working environment * real estate department and faculties begin to regularly integrate space requirements and the real estate strategy into their joint initiatives * real estate adds value to the primary process and thereby improves the productivity * anticipating on trends, measuring and monitoring their impacts	* high frequency of revising and adjusting financial plans to match the strategic plans and changing demands * willingness to invest a larger amount of money in projects which create added value on the long-term (balance between financial value, risks &costs and added value) * real estate adds value to financial goals and thereby improves the profitability * real estate department is closely aligned with CFO * anticipating on trends, measuring and monitoring their impacts	* generating future sustainability plans for continuous improvement * willingness to keep outdated buildings which create added value in other aspects (balance between physical condition and added value) * real estate adds value to sustainability goals and thereby improves the sustainable development * anticipating on trends, measuring and monitoring their impacts

Table 6.2 – Assessment of development stage from real estate perspectives (own table)

FORUM BUILDING, WAGENINGEN CAMPUS
PHOTO: WUR

CHAPTER 7 – WAGENINGEN UNIVERSITY & RESEARCH

7.1 WAGENINGEN UNIVERSITY & RESEARCH

Wageningen University & Research (WUR) is a partnership between Wageningen University and Wageningen Research (Wageningen University & Research, n.d-a). WUR was founded in 1876 as Agricultural College and became a legal institute of higher education in 1918. The current name, Wageningen University & Research, was established in 2016 (WUR, 2018a). Around 2000, WUR decided to leave its former location and move to another site, which is now known as Wageningen Campus. Since this relocation is only nineteen years ago, the current real estate portfolio of WUR is still young in comparison to other Dutch universities. The current campus comprises 26 building and 250.000 square meters gross floor area (Algemene Rekenkamer, 2018). WUR accommodates 12.000 students, 1.673 scientists and 1.186 support and management staff (VSNU, 2018). Table 7.1 presents facts and figures of Wageningen University & Research.

Figure 7.1 – Logo Wageningen University & Research (*https://www.wur.nl/nl/nieuws/Nieuw-merk-voor-Wageningen-UR-en-onderzoeksinstituten-Wageningen-University-Research.htm*)

Education	
Bachelor programmes	19
Master programmes	29
Student population	12.000
PhD students	1.900
First year student	2.977
Master degrees	1.851
Research	
Professors (FTE)	97
Publications	4.8216
Promotions	295
Valorisation	
Start-ups	23
Patents in portfolio	139
Personnel	
Scientific staff (FTE)	1.543
Scientific staff (headcount)	1.673
Supporting staff (FTE)	982
Supporting staff (headcount)	1.186
Finances	
Government funding	189,9 M€
Indirect funding	28,6M€
Contract funding	59,1M€

Table 7.1 – Facts and figures Wageningen University & Research (WUR, 2018a)

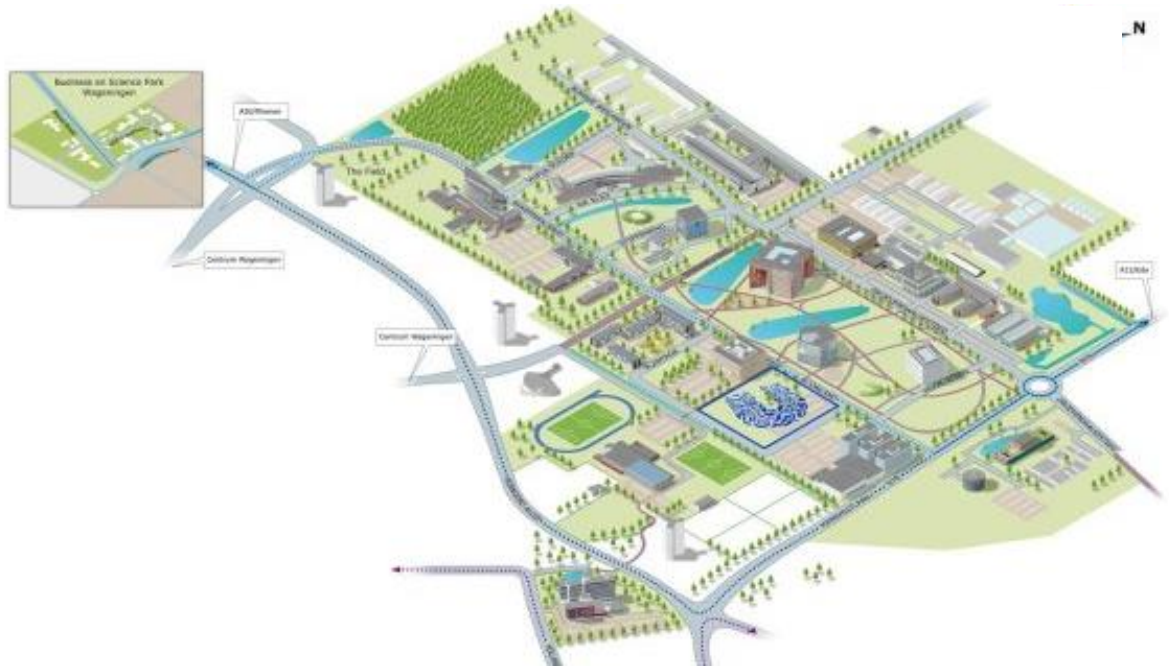


Figure 7.2 – Campus Wageningen University & Research (*https://resource.wur.nl/nl/show/Unilever-vestigt-RD-centrum-op-campus-.htm*)

7.2 ORGANISATIONAL STRUCTURE

WUR's organisational structure is discussed in Chapter 5. An detailed analysis of the organisational structure can be found in Appendix II.

7.3 UNIVERSITY REAL ESTATE MANAGEMENT

WUR's real estate management process is analysed in the following section by using the analytical framework discussed in Chapter 4. WUR's real estate management process is assessed by the development stage of the real estate department – *task manager, controller, dealmaker, intrapreneur,* and *business strategist* – from each CREM perspective – *strategic, functional, financial,* and *physical*.

7.3.1 STRATEGIC PERSPECTIVE

Communication and collaboration with Supervisory Board and Executive Board

The real estate department communicates regularly with the Executive Board (WUR, personal communication, March 22, 2019). The interaction between WUR's real estate department and senior management works two ways: on the one hand, the RE&H department consults with the Executive Board on real estate related issues, and proposes solutions. On the other hand, the Executive Board picks up real estate related signals from the other organisational units, and consults the RE&H department to propose solutions. The Executive Board expects the RE&H department to be aware of these signals from the organisational units as well (WUR, personal communication, March 22, 2019).

Strategic focus

The strategic focus of the real estate department is made explicit in several plans. The most important real estate plan is the real estate strategy. The first real estate strategy was completed in 2012/2013 (WUR, personal communication, March 22, 2019). This first strategic plan – called the Strategic Construction Plan (Dutch: *"Strategisch Nieuwbouwplan")* – focused on concentrating all organisational units on WUR's current campus: Wageningen Campus. Before 2000, the real estate portfolio was located in De Dreijen, which is another location in Wageningen. The new strategic plan focused on moving the organisational units from De Dreijen to Wageningen Campus, and stated how and when the units would be moved (WUR, personal communication, March 22, 2019).

In 2012, the RE&H department designed a second real estate strategy – Strategic Construction Plan 2 (Dutch: *"Strategisch Nieuwbouwplan")* (WUR, personal communication, March 22, 2019). During the first real estate plan, the RE&H department noticed the university was growing in student numbers, which meant more facilities were needed. Thus, the second strategic plan focused on building a new educational building and research building. The second strategic plan was completed in 2016/2017 (WUR, personal communication, March 22, 2019).

In 2016, the RE&H department designed a campus vision – Strategic Campus Development Plan (Dutch: *"Strategisch Plan Campusontwikkeling"*) (WUR, personal communication, March 22, 2019). During the implementation of the second strategic plan, Wageningen Campus developed quickly, and became an attractive location for labour-intensive companies. The Strategic Campus Development Plan therefore focused on making Wageningen Campus a suitable location for these companies (WUR, personal communication, March 22, 2019).

Currently, the RE&H department is designing a second campus vision (WUR, personal communication, March 22, 2019). The third strategy will focus on accommodating the growing number of students, which means another educational building will be constructed. This strategic plan will be designed for a period up to 2025 (WUR, personal communication, March 22, 2019). The RE&H department is aware a third real estate strategy will be necessary after the completion of the second campus vision, because of the ever-growing student numbers (WUR, personal communication, March 22, 2019).

The presence of these four strategic plans proves that the RE&H department has been focusing on creating value for the university in the last decade. The design of the latest real estate strategy proves the real estate department also has a long-term focus. Table 7.2 provides an overview of all strategic plans.

To conclude, WUR's real estate department can be positioned at the *Business Strategist* stage of the five development stages of Joroff et al. (1993). The regular communication and collaboration with senior management and the different real estate plans indicate that the RE&H department has a strong strategic focus, and anticipates on trends which impact the university's real estate. The regular interaction with senior management helps improving the match between WUR's strategic plans and the real estate plans.

Strategic Plans		Focus
Strategic Construction Plan *Strategisch Nieuwbouwplan*	2012/2013	Concentration of WUR's real estate properties on Wageningen Campus
Strategic Construction Plan 2 *Strategisch Nieuwbouwplan 2*	2016/2017	Construction new educational building and research building to match the growing university
Strategic Campus Development Plan *Strategisch Plan Campusontwikkeling*	2025	Creating a campus suitable for labour-intensive companies
Strategic Campus Development Plan 2 *Strategisch Plan Campusontwikkeling 2*	Beyond 2025	Construction new educational building to match the growing university
Strategic Construction Plan 3 *(uncertain)* *Strategisch Nieuwbouwplan 3*	Beyond 2025	Construction new educational building to match the growing university

Table 7.2 – Overview of the strategic plans of Real Estate & Housing

7.3.2 FUNCTIONAL PERSPECTIVE

Communication and collaboration with faculties

The most important users of university real estate are the faculties. In the case of WUR, the university has only one faculty that is divided into several organisational units. The Real Estate & Housing department considers it important to match the real estate with the user demands (WUR, personal communication, March 22, 2019).

The interaction between the RE&H department and the different organisational units works two ways: on the one hand, the RE&H department proposes solutions and plans to the organisational units. On the other hand, the organisational units are the customers of the RE&H department, and submit real estate projects to the real estate department (WUR, personal communication, March 22, 2019).

During projects, two employees are involved in the interaction: one from the organisational unit, and one from the Facilities & Services department. Only involving two employees ensures an intensive coordination and short communication lines. Other relevant communication lines are the decision-making process and financial approval; these two lines go to the director Operational Management of the organisational unit (WUR, personal communication, March 22, 2019).

In addition to the regular interaction, the RE&H department also collects user demands and user satisfaction on a yearly basis (WUR, personal communication, March 22, 2019). At least once a year, the RE&H department consults with the director Operational Management and the location manager of each organisational unit to gather information on the real estate demands and wishes (WUR, personal communication, March 22, 2019).

Centralised decision-making and concentrated activities

The organisational units do not have their own real estate department. Thus, all real estate activities are concentrated with the central RE&H department. One of the disadvantages of a concentrated structure is that it is more difficult to align real estate services with the primary process (Bank & den Heijer, 2004). Facilities & Services therefore delegate location managers to all organisational units (WUR, personal communication, March 22, 2019). The location managers are responsible for all supporting services of its organisational unit (WUR, personal communication, March 22, 2019). The location managers are delegated from the Facilities & Services department (WUR, personal communication, March 22, 2019). An advantage of delegating location managers is that real estate issues can be solved quickly, as the communication lines are short between the organisational units and the Facilities & Services department (WUR, personal communication, March 22, 2019).

To conclude, Real Estate & Housing can be positioned at the fourth stage of the five development stages of Joroff et al. (1993): the *Intrapreneur* stage. The regular and intensive interaction with the organisational units confirms that the RE&H department considers it important to match the real estate with the user demands. However, centralised and concentrated real estate management causes difficulties in aligning real estate services with the primary process.

7.3.3 FINANCIAL PERSPECTIVE

Financial controllers

The relevant stakeholders from the financial perspective are the financial controllers of the university (den Heijer, 2011). WUR has a central financial department – Finance – which is part of the Facilities & Services department (WUR, personal communication, March 22, 2019). The RE&H department does not have its own financial department (WUR, personal communication, March 22, 2019). Thus, the financial controllers are located at one central place in the organisation; at the level of the Facilities & Services department. The financial controllers are thus not solely concerned with real estate, but with all support services of WUR.

Financial tools and systems

The RE&H department considers it important to match WUR's real estate portfolio to the primary processes (WUR, personal communication, March 22, 2019). However, the real estate department focuses on doing so at the lowest costs possible (WUR, personal communication, March 22, 2019).

The yearly budget is created by the Finance department (WUR, personal communication, March 22, 2019). The F&C department determines the budget for all supporting services (WUR, personal communication, March 22, 2019). The RE&H department proposes its real estate plan for the coming years to the Finance department, and the central financial department takes the plans into account when creating the budget (WUR, personal communication, March 22, 2019). As Finance is located at the central Facilities & Services department, the F&C department is responsible for the financial resources of all supporting services, not only for real estate (WUR, personal communication, March 22, 2019). The Finance department thus must also consider all other supporting services when creating the real estate budget (WUR, personal communication, March 22, 2019). To conclude, the real estate budget is created both top-down and bottom-up; the Finance department decides what the yearly budget is for real estate, and the RE&H department provides input for the budget.

Another financial system used by the real estate department, is the internal costing of real estate. The organisational units of WUR have to pay for their housing (WUR, personal communication, March 22, 2019).

To conclude, WUR's real estate department can be positioned at the *Dealmaker* stage of the five development stage of Joroff et al. (1993). Consideration underlying the determination of this position include the presence of financial tools and systems, such as the financial real estate budget and the internal costing of real estate. The department focuses on providing real estate services at the lowest costs possible.

7.3.4 PHYSICAL PERSPECTIVE

Maintenance plans

Even though WUR's real estate portfolio does not consists of buildings older than 30 years, the RE&H department does have maintenance plans for all properties (WUR, personal communication, March 22, 2019). The real estate department uses a depreciation period of 60 years for all its properties (WUR, personal communication, March 22, 2019).. At year 30, it is decided whether the university will keep the property or dispose of it (WUR, personal communication, March 22, 2019).. If the university decides to keep the property, a major renovation project will be started (WUR, personal communication, March 22, 2019).. At year 15, 30 and 45, major maintenance interventions will be performed on the physical condition of the property (WUR, personal communication, March 22, 2019).. The real estate department also measures the physical condition of all real estate properties on a regular basis (WUR, personal communication, March 22, 2019). Thus, the RE&H department has an overview of each of its properties, and knows what maintenance activities must be completed in which years (WUR, personal communication, March 22, 2019).

Sustainable development

WUR has a strong focus on sustainability, which is expressed in its ambitions for innovation & research and education (WUR, 2018a):

"*Contribute to the global challenges in the field of ecology, sustainability, public health and food safety"*
"Implement the latest insights in the area of embedding sustainability in education"

The focus on sustainability is visible through the many rankings in which the university scores high. WUR is the greenest and most sustainable university in the world, according to the GreenMetric ranking (WUR, 2017). The GreenMetric ranking ranks how universities deal with for example CO_2 emissions, chemical waste and water recycling (WUR, 2017). According to the ranking SustainaBul, WUR has the most sustainable university in the Netherlands (WUR, n.d.-c).

The sustainability ambitions are also made explicit in several plans, such as the Wageningen Climate Plan 2017-2021, the Multi-year Environmental Plan 2018-2020, and the Energy Vision 2030. The Energy Vision 2030 is an example of a long-term sustainability plan; the plan has been drawn up as an guideline for the longer term. The university also monitors the energy performance of all real estate properties, and also measures the climate impact (WUR, n.d.-c). Energy performance is an

important element for sustainability, since it has a direct effect on WUR's continuity, and account for a large proportion of the sustainability of the organisation's operation (WUR, 2014). Figure 7.3 and Figure 7.4 provide information on environmental results in the last years.

	2013	2014	2015	2016	2017
Reduction of CO_2 emissions by % compared to 2010[2]	43	47	46	47	51
Annual energy reduction (%)	4.5	4.2	3.4	2.3	6.0

Figure 7.3 – Reduction of CO_2 emissions and energy (WUR, 2018a)

Component/Issue	Objective	Achievements in 2017
(1) CO_2 footprint	Reduction relative to 2010	-51%
CO_2 compensation footprint	Increase relative to 2010	77%
Climate neutrality		112%
(2) Energy	2.0% reduction per year	-6%
	Sustainable electricity procurement	100% [a)]
	Generating wind energy	60 million kWh
(3) Waste	Reduction relative to 2014	-0.3%

Figure 7.4 – Environmental results in 2017(WUR, 2018a)

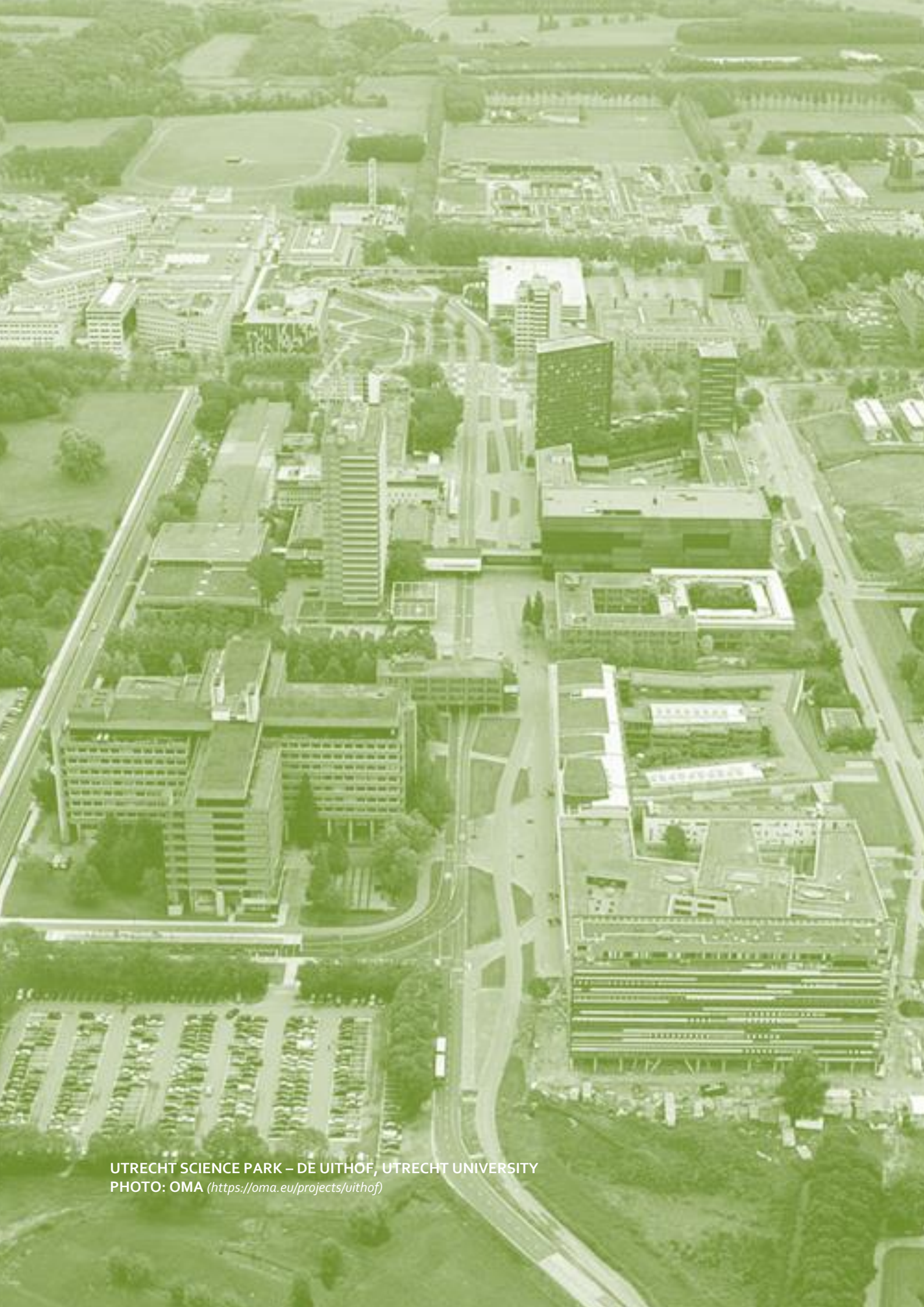
To conclude, Real Estate & Housing can be positioned at the fifth development stage of Joroff et al. (1993): the *Business Strategist* stage. WUR has a strong focus on sustainable development, which is reflected by the RE&H department's ambitions. In the last few years, the university has scored high on both national and international sustainability rankings. Both the university and the real estate department produce sustainability plans to express their ambitions, and provide guidelines how to achieve their ambitions. The RE&H department regularly assesses the physical aspects of the real estate portfolio, and has a maintenance plan for each individual property.

7.3.5 ASSESSMENT UNIVERSITY REAL ESTATE MANAGEMENT

Table 7.3 summarises the analysis of WUR's real estate management process.

	Strategic	Functional	Financial	Physical
	aligning real estate with institutional goals	aligning real estate with (primary) processes	aligning real estate financial value, risks and costs with production of products and services	maintaining quantity and quality of current and future real estate
Task manager	* supply in university's demand for real estate * senior management is involved with real estate department	* supply in faculties' demand for real estate * real estate enables students and researchers to produce knowledge	* supply in demand for real estate within budgets * real estate is viewed as neither a cost nor benefit	* supply in demand for real estate * provide general service on real estate as needed * corrective maintenance
Controller	* real estate department reports results to the senior management * presence of statements related to strategic goals, but not made explicit in plans	* physical environment optimal for primary process * analyses of primary processes * interaction and dialogue with faculties about their short- and long-term needs	* supply in demand for real estate at the lowest cost possible * awareness of potential costs and benefits of real estate * control and minimize real estate costs * analytical focus	* awareness of technical building costs * reducing square meters * presence of statements related to sustainability goals, but not made explicit in plans
Dealmaker	* strategic focus is made explicit in plans * real estate department communicates regularly with senior management * real estate department behaves proactively and comes up with new ideas	* physical environment optimal for faculties * analyses of user satisfaction * real estate department works together with faculties to identify the optimal space needs * standardisation real estate usage	* presence of financial tools and systems * balancing real estate costs against increasing costs of primary process * internal costing of real estate costs * analysing and documenting sources of market value	* basic inventory routines on real estate * focus on sustainability is made explicit in plans * analysis of physical aspects real estate portfolio * presence of maintenance plans * preventive maintenance
Intrapreneur	* full implementation or ongoing execution of strategic plans * long-term strategic planning * real estate department works closely together with senior management * matching the real estate department's strategy to its competitors' * real estate department coordinates plans with other support services	* overview of space use * overview of occupancy rates and frequency rates of real estate * real estate department works closely together with faculties and is involved in faculties' strategic planning processes * proposing real estate data and alternatives to faculties	* balancing real estate costs against optimising and increasing productivity * proving importance real estate through measurable results * real estate department acts as profit center * presence of financial controllers within the real estate department * long-term financial planning * scenario and risk planning	* full implementation or ongoing execution of sustainability plans * full implementation or ongoing execution of maintenance plans * proposing innovative and sustainable solutions * overview of real estate's energy performance * long-term maintenance planning
Business strategist	* generating future strategic plans for continuous improvement * high frequency of revising and adjusting real estate plans to match the changing demands * anticipating on trends, measuring and monitoring their impacts and contributing to the direction of the university as a whole * real estate department is closely aligned with senior management * real estate adds value to institutional goals and thereby improves the competitive advantage	* generating future plans to improve space use and thereby maximise efficiency * a state of the art learning and working environment * real estate department and faculties begin to regularly integrate space requirements and the real estate strategy into their joint initiatives * real estate adds value to the primary process and thereby improves the productivity * anticipating on trends, measuring and monitoring their impacts	* high frequency of revising and adjusting financial plans to match the strategic plans and changing demands * willingness to invest a larger amount of money in projects which create added value on the long-term *(balance between financial value, risks &costs and added value)* * real estate adds value to financial goals and thereby improves the profitability * real estate department is closely aligned with CFO * anticipating on trends, measuring and monitoring their impacts	* generating future sustainability plans for continuous improvement * willingness to keep outdated buildings which create added value in other aspects *(balance between physical condition and added value)* * real estate adds value to sustainability goals and thereby improves the sustainable development * anticipating on trends, measuring and monitoring their impacts

Table 7.3 – Assessment of development stage from real estate perspectives



UTRECHT SCIENCE PARK – DE UITHOF, UTRECHT UNIVERSITY
PHOTO: OMA *(https://oma.eu/projects/uithof)*

CHAPTER 8 – UTRECHT UNIVERSITY

8.1 INTRODUCTION

Utrecht University (UU) is the second largest Dutch university in terms of student numbers – approx. 31.800 in 2018. With seven faculties, 50 bachelor programmes and 147 master programmes, the university accommodates over 31.800 students, 3.600 scientists and 2.500 support and management staff (Universiteit Utrecht, 2019a). UU was founded in 1636 as *Rijksuniversiteit te Utrecht*. The current name, Utrecht University, was established in 1992 (Universiteit Utrecht, n.d.-a). With 644.000 square meters gross floor area, the university has the largest real estate portfolio of all Dutch universities (Algemene Rekenkamer, 2018). The current portfolio consists of three campuses: Campus Utrecht Science Park, Binnenstadscampus Universiteitskwartier and International Campus Utrecht (University Utrecht, n.d.-b). Table 8.1 presents facts and figures of Utrecht University.

Education	
Bachelor programmes	50
Master programmes	147
Student population	31.801
PhD students	908
First year student	6.536
Master degrees	4.507
Research	
Professors (FTE)	3.123
Publications	6.948
Promotions	525
Valorisation	
Science based & academic start-ups	111
Personnel	
Scientific staff (FTE)	3.123
Scientific staff (headcount)	3.655
Supporting staff (FTE)	2.561
Supporting staff (headcount)	3.536
Finances	
Government funding	496M€
Indirect funding	52M€
Contract funding	242M€

Figure 8.1 – Logo Utrecht University (https://www.uu.nl/organisatie/huisstijl/richtlijnen/huisstijlelementen/logo-van-de-universiteit-utrecht)

Table 8.1 – Facts and figures Utrecht University (UU, 2019a)

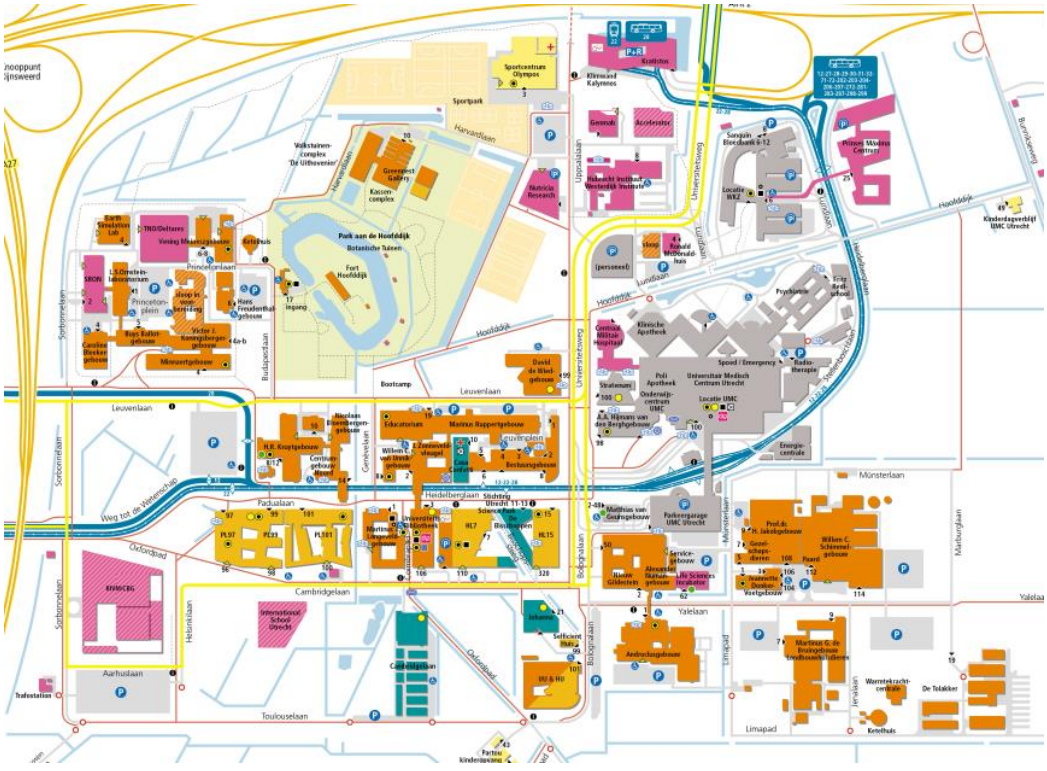


Figure 8.2 – Science Park Utrecht Utrecht University (https://www.utrechtsciencepark.nl/nl/over-het-park/plattegrond)

8.2 ORGANISATIONAL STRUCTURE

The organisational structure of Utrecht University is discussed in Chapter 5. An detailed analysis of the organisational structure can be found in Appendix III.

8.3 UNIVERSITY REAL ESTATE MANAGEMENT

The real estate management process of Utrecht University is analysed in the following section by using the analytical framework discussed in Chapter 4. UU's real estate management process is assessed by the development stage of the real estate department – *task manager, controller, dealmaker, intrapreneur,* and *business strategist* – from each CREM perspective – *strategic, functional, financial,* and *physical*.

8.3.1 STRATEGIC PERSPECTIVE

Strategic focus

The strategic focus of Corporate Real Estate & Campus is made explicit in its real estate plans. The strategic plans made by the university are the starting point for these real estate plans (UU, personal communication, April 5, 2019). The university expresses its goals and objectives through its strategic plans, and the real estate department translates these institutional goals and objectives into real estate goals and objectives (UU, personal communication, April 5, 2019). The latest strategic plan set up by the university is the Strategic Plan 2016-2020 (Figure 8.3), and the current real estate strategy is the Strategic Housing Plan 2017-2027 (*Dutch: Strategisch Huisvestingsplan 2017-2027).*

Figure 8.3 – Strategic Plan 2016-2020 (Universiteit Utrecht, 2016)

The university sets up strategic plans every four years (UU, 2019a). However, the Strategic Housing Plan 2017-2027 is the first real estate strategy designed by the real estate department. Before 2016, there were no major real estate plans on university level, only smaller housing plans at campus or faculty level (UU, 2019a; UU, personal communication, April 5, 2019) (see Figure 8.4). In 2016, the CRE&C department decided to design this real estate strategy for two reasons: awareness of necessary focus on qualitative and financial aspects of the real estate portfolio, and the limited financial resources of the real estate department (UU, personal communication, April 5, 2019). In 1995, the real estate portfolio has been transferred from the Dutch Government to the university, and since that time a lot of real estate properties have been added to the portfolio. However, only small real estate interventions have taken place (UU, personal communication, April 5, 2019). At the moment, substantial investments have to be made to the portfolio due to the growing student numbers, educational renewal (UU, personal communication, April 5, 2019), and the aging portfolio (UU, 2019a). The necessary reinvestments regarding the qualitative and financial aspects of the real estate portfolio and the limited financial resources require having a solid strategic plan (UU, personal communication, April 5, 2019).

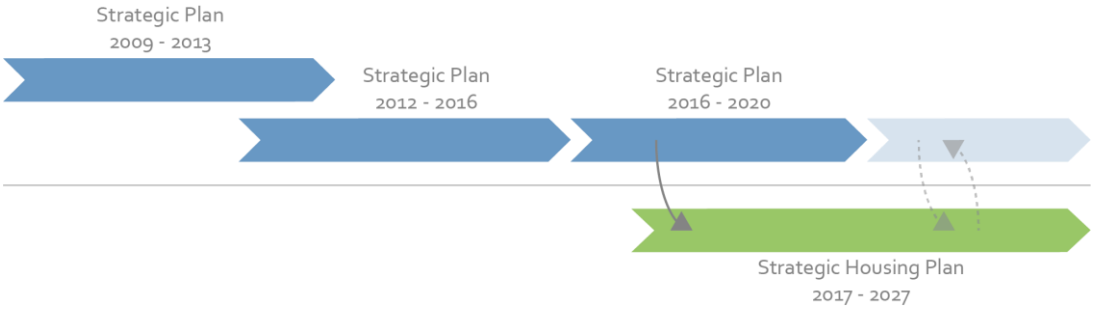


Figure 8.4 – Overview of institutional strategic plans (blue) and strategic real estate plans (green) in the last decade (own ill.)

Reorganisation

In 2018, the CRE&C department has faced a major reorganisation (UU, personal communication, April 5, 2019). With the reorganisation, the three levels of management are introduced: strategic, tactical or operational. Each organisational component focuses on one of the three levels (UU, personal communication, April 5, 2019). The new organisational structure makes it possible to have a better focus on each of the three levels, it promotes efficiency, and it reduces the workload (UU, personal communication, April 5, 2019). As a result, the decision-making process can become more effective and faster (UU, personal communication, April 5, 2019). The organisational changes prove that the real estate department is thinking on a more strategic level.

Communication and collaboration Executive Board

The Executive Board monitors the strategic plans of the faculties and the University Corporate Offices by means of quarterly reports (UU, 2019a. The strategic plans of the real estate department are thus discussed every quarter of the year with the Executive Board. The Executive Board also has periodic bilateral meetings with the faculties and the directors of the University Corporate Offices (UU, 2019a). The regular communication between the Corporate Real Estate & Campus department and the Executive Board is important for the alignment of real estate plans and the university's strategic plans.

To conclude, UU's real estate department can be positioned at the *Intrapreneur* stage of the five development stages of Joroff et al. (1993). The design of the real estate strategy – *Strategic Housing plan 2017-2027* – shows that the real estate department has a strategic focus. However, this strategy is the first solid real estate plan set up by the department, and future strategic real estate plans are not discussed yet. Although the department recently developed its strategic focus, the department works closely together with the Executive Board; the design of the real estate strategy was done together with the Executive Board. The regular interaction will help the real estate department in improving the alignment between the institutional strategic plans and the real estate plans.

8.3.2 FUNCTIONAL PERSPECTIVE

Communication and collaboration with faculties

The real estate department works closely together with the faculties. During real estate projects and development processes, the faculties are directly involved by the CRE&C department (UU, personal communication, April 5, 2019). The faculties are also involved in important decision-making moments, and help the real estate department set up their plans (UU, personal communication, April 5, 2019). Thus, the faculties are directly involved with the real estate management process, and the real estate department is directly involved in the faculty's primary processes.

The aim of the reorganisation of the real estate department was to work more customer-oriented, rather than task-oriented (UU, personal communication, April 5, 2019). Most of the organisational changes are focused on improving and strengthening the relationship with the faculties, and a better alignment of real estate and user demands (UU, personal communication, April 5, 2019).

Centralised decision-making and concentrated activities

The faculties do not have their own real estate department (UU, personal communication, April 5, 2019). Thus, the decision-making process is centralised and all real estate activities are concentrated at the central CRE&C department. A major disadvantage of having a centralised and concentrated real estate department is that it becomes more difficult to align the real estate plans with the users' demands (Bank & den Heijer, 2004). To match the real estate plan to the users' demands, the CRE&C department delegates demand managers to every faculty (UU, personal communication, April 5, 2019). The demand managers are the representatives of the faculties, and are responsible for the smaller internal real estate projects of the faculties (UU, personal communication, April 5, 2019). The demand managers do not solely focus on real estate; they are also concerned with the facility services of the faculties (UU, personal communication, April 5, 2019).

Monitoring space use

Space use is an important indicator for the functional perspective, as it expresses the functionality of the real estate (den Heijer, 2011). The CRE&C department keeps annual reports of its real estate, in which different aspects of the real estate portfolio is analysed and discussed. One of these aspect is space use. The real estate department monitors the space use of the different faculties, as well as the support services (UU, n.d.-b). Figure 8.5 shows two charts of the space use in 2016.

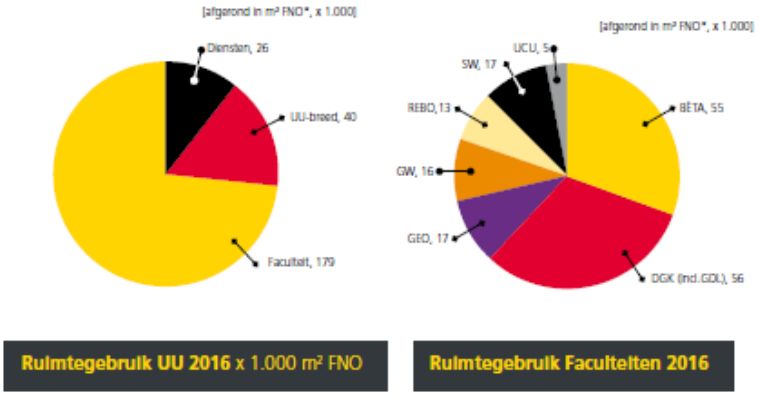


Figure 8.5 – Overview of space use in 2016 (UU, n.d.-b)

Organisational subdivision

The level of adjustment to the real estate portfolio is another structural indicator for the organisational structure, which is not included in the analytical framework. Certain characteristics of the real estate portfolio can be a reason to split up the organisation into different organisational units that are focused on a specific part of the real estate portfolio, as shown in Figure 8.6 (Bank & den Heijer, 2004). According to Bank & den Heijer (2004), universities with a large geographically widely spread portfolio adjust their organisational structure and create different organisational unites for parts of the portfolio (p. 4). Utrecht University has the largest real estate portfolio in terms of square meters gross floor area (den Heijer, 2011). The portfolio consists of three separate campuses: Binnenstad, Utrecht Science Park, and International Campus Utrecht (UU, n.d.-c). Due to the size of the portfolio, the CRE&C department is subdivided into two regions: Binnenstad & ICU and Science Park (UU, personal communication, April 5, 2019) (see Figure 8.5). The aim of the subdivision is to strengthen the relationship with the faculties, and to better align the real estate portfolio to the users' demands (UU, personal communication, April 5, 2019).

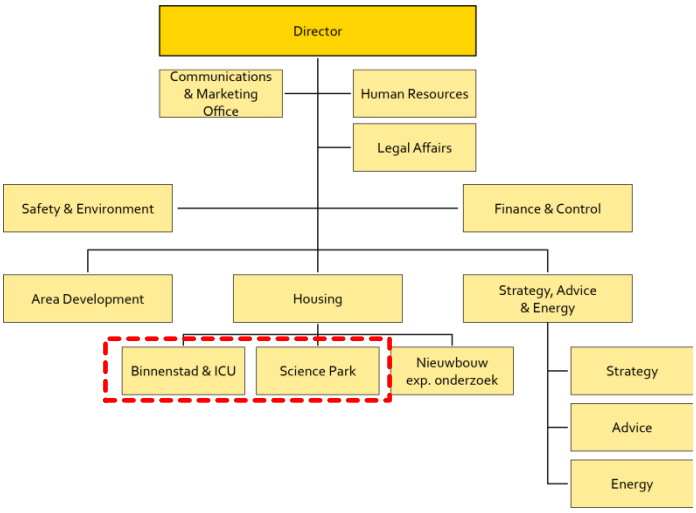


Figure 8.5 – Organisational units focusing on different parts of the portfolio: Binnenstad & ICU and Science Park (own ill. based on interview)

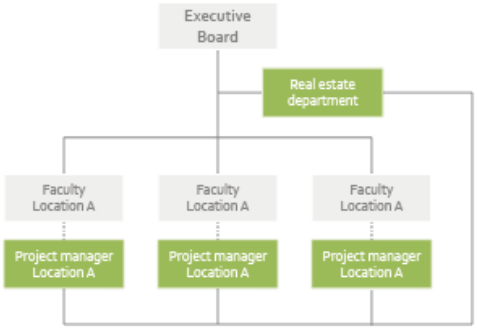


Figure 8.6 – The level of adjustment to the real estate portfolio (Bank & den Heijer, 2004)

To conclude, the Corporate Real Estate & Campus department can be positioned at the *Intrapreneur* stage of the five development stages of Joroff et al. (1993). Considerations underlying the determination of this stage include the customer-oriented focus, the monitoring of space use, the involvement of the faculties in the real estate management process, and the renewed focus of the real estate department on improving and strengthening the relationship with the faculties.

8.3.3 FINANCIAL PERSPECTIVE

Financial controllers

Utrecht University has a financial department – Finance, Control & Administration (FCA) – which is part of the University Corporate Offices. The central financial department provides financial advice to the Executive Board and the faculties. The CRE&C department has its own financial department: Finance & Control Woonbedrijf (FCW). The FCW department is concerned with the financial management of both Corporate Real Estate and Campus and Facility Services (UU, n.d.-e). FCW is responsible for the planning and control cycles, and efficient administrative management and a consistent administrative organisation (UU, n.d.-e). The FCW department is created to control the real estate investments (UU, personal communication, April 5, 2019). The CRE&C department and Facility Services department are two major support services that have approx. 290-340 employees (UU, personal communication, April 5, 2019). Real estate is always accompanied by major expenses and investments, which is the why it is important to have a separate department that controls and checks these expenses and investments, and that is solely concerned with real estate (UU, personal communication, April 5, 2019).

Financial tools and systems

Due to the reorganisation in 2018, the CRE&C department is currently in a transition from being cost-driven to becoming more value-driven (UU, personal communication, April 5, 2019). The decision-making process used to be explicitly cost-driven, but after the reorganisation the department started focusing on other added values of real estate (UU, personal communication, April 5, 2019). The renewed focus proves that the real estate department is well aware of the value of its real estate and how its real estate can add value to the organisation.

The real estate department is well aware of the financial costs and benefits of its real estate portfolio, which can be seen in the financial plans. In the annual reports of the real estate department, the real estate exploitation is also presented. The CRE&C department analyses the costs and benefits of its real estate, and compares these with previous years. Figure 8.8

shows four charts from the annual report of 2016, in which the costs and benefits are presented. Table 8.2 presents the financial investments in real estate for the upcoming years. The financial planning is based on the Strategic Housing Plan 2017-2027, and is set up by the university (UU, 2019a). The Strategic Housing Plan will be revised and adapted in 2019, which will include scenario planning (UU, 2019a). The revision can lead to changes in the financial planning.

To conclude, UU's real estate department can be positioned at the *Business Strategist* stage of the five development stage of Joroff et al. (1993). The CRE&C department is aware of the added value of its real estate and looks beyond only the financial value; the department creates long-term financial plans, uses scenario planning, and monitors and analyses its real estate costs and benefits.

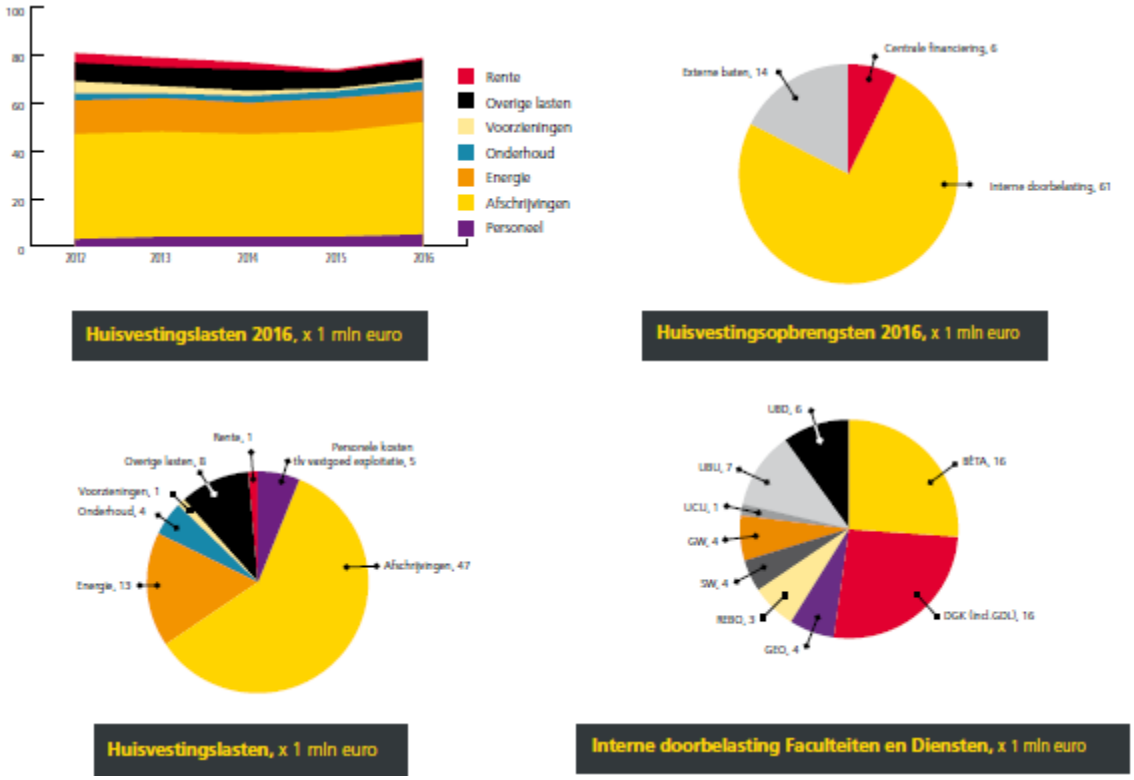


Figure 8.7 – Real estate exploitation: costs (left) benefits (right) (2016) (UU, n.d.-b, p. 7)

*Bedragen * M€ Prijspeil 2018*	2017 realisatie	2018 realisatie	2019	2020	2021	2022	2023	2024	2025	2026	Totaal
			Prognose								
Investeringen: Nieuwbouw & renovatie	59,7	35,4	62,0	76,0	61,0	123,0	34,2	34,2	34,2	34,2	554,0
Investeringen: Onderhoud	11,3	19,6	35,0	33,0	20,0	18,0	12,0	12,0	12,0	12,0	184,9
Totaal	71,0	55,0	97,0	109,0	81,0	141,0	46,2	46,2	46,2	46,2	738,9
Totaal	*Realisatie:*	126,0						*Nog te realiseren:*		612,9	738,9

Table 8.2 – Financial planning (prognosis) until 2026 (UU, 2019a, p. 51)

8.3.4 PHYSICAL PERSPECTIVE

Management and Maintenance

Two years ago, the CRE&C department assessed the physical condition of all its real estate (UU, personal communication, April 5, 2019). Based on this assessment, several projects are incorporated into the Strategic Housing Plan 2017-2027, and are currently being executed (UU, personal communication, April 5, 2019). Together with the Strategic Housing Plan, a maintenance planning has been set up that has the same time span, and is regularly revised and updated (UU, personal communication, April 5, 2019).

With the reorganisation in 2018, management and maintenance tasks are transferred to the Facility Services department (UU, personal communication, April 5, 2019). This type of organisational structure is also discussed by Bank & den Heijer (2004): the joining or separation of the strategic and operational level (see Figure 8.9). Having the strategic and operational level within one department has the advantage that the real estate decision-makers have knowledge and expertise of both levels, which makes it easier to align operational tasks with strategic planning and policy (Bank & den Heijer, 2004). The CRE&C department and FS department communicate regularly, and are focused on aligning the real estate plans created by the CRE&C department and the management and maintenance tasks of the FS department (UU, personal communication, April 5, 2019). However, the real estate strategy is still being implemented and contains many uncertainties, which causes friction between the CRE&C department and Facility Services (UU, personal communication, April 5, 2019).

Figure 8.8 – Position of the strategic and operational level within the organisation (Bank & den Heijer, 2004) edited

Sustainable development

UU is one of the oldest Dutch universities, which can still be seen in its current campus (UU, personal communication, April 5, 2019; den Heijer, 2011). The old buildings, predating the twentieth Century, are seen as the heritage of the university (UU, personal communication, April 5, 2019). However, some of these buildings do not meet modern day requirements, such as sustainability, but because of their historical value the buildings are kept in the real estate portfolio (UU, personal communication, April 5, 2019).

The CRE&C department has designed several plans that focus on sustainable development of the real estate portfolio, such as the Integral Energy Strategy, the CO_2 Strategy, the ambition document Utrecht Science Park, and the ambition document Future-proof Buildings Utrecht University. In these plans, the university and the real estate department express their ambitions for sustainable development of their real estate, and analyse and assess the physical aspects of their real estate portfolio, such as CO_2 footprint (see Figure 8.9), energy production and waste production.

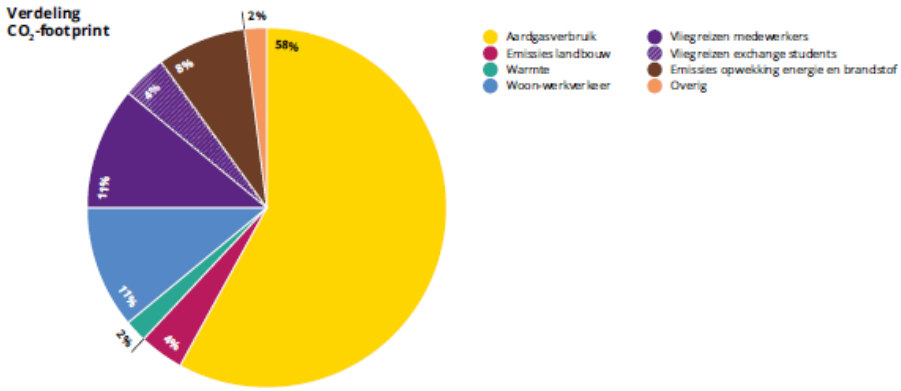


Figure 8.9 – CO_2 footprint Utrecht University (UU, 2019a)

The most recent plan is Future-proof Buildings Utrecht University. The plan is created in 2019, and focuses not only on the older buildings in the real estate portfolio, but also is concerned with all new build projects and renovation projects (Universiteit Utrecht, 2019b). Figure 8.10 illustrates the aim of the plan: creating real estate with a future-proof quality for people, planet and profit (UU, 2019b). This not only concerns saving financial value (profit), but also the preservation and

creation of ecological value (planet) and social value (people) (UU, 2019b, p. 4). According to the plan (UU, 2019b), future-proof buildings are: functional, healthy, energy generating and circular (pp. 7-9).

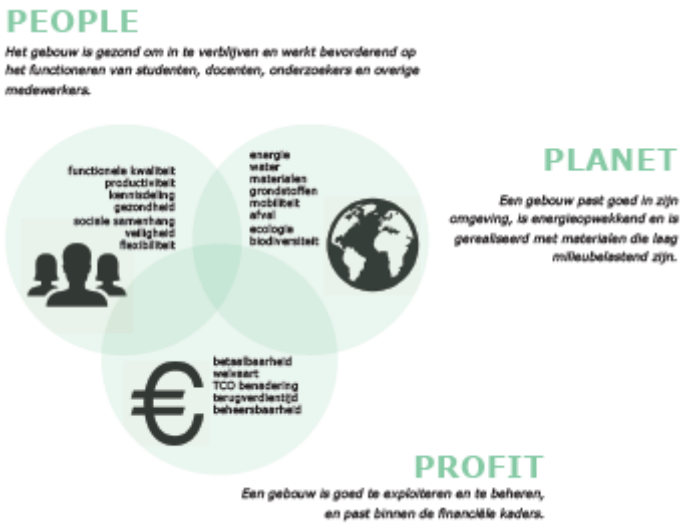


Figure 8.10 – Creating real estate with a future-proof quality for people, planet and profit (UU, 2019b)

To conclude, Corporate Real Estate & Campus can be positioned at the fourth development stage of Joroff et al. (1993): the *Business strategists* stage. The CRE&C department has a strong focus on sustainable development, which is reflected in the department's ambitions and plans, such as the Future-proof Buildings plan. Management and maintenance plans are present, and are regularly revised and updated. However, with the reorganisation, the strategic and operational real estate tasks have become separated, which makes it difficult to align the management and maintenance of the portfolio with the strategic real estate plans, and creates friction between the CRE&C department and Facility Services department.

8.3.5 ASSESSMENT UNIVERSITY REAL ESTATE MANAGEMENT

Table 8.3 summarises the analysis of UU's real estate management process.

	Strategic	Functional	Financial	Physical
	aligning real estate with institutional goals	aligning real estate with (primary) processes	aligning real estate financial value, risks and costs with production of products and services	maintaining quantity and quality of current and future real estate
Task manager	* supply in university's demand for real estate * senior management is involved with real estate department	* supply in faculties' demand for real estate * real estate enables students and researchers to produce knowledge	* supply in demand for real estate within budgets * real estate is viewed as neither a cost nor benefit	* supply in demand for real estate * provide general service on real estate as needed * corrective maintenance
Controller	* real estate department reports results to the senior management * presence of statements related to strategic goals, but not made explicit in plans	* physical environment optimal for primary process * analyses of primary processes * interaction and dialogue with faculties about their short- and long-term needs	* supply in demand for real estate at the lowest cost possible * awareness of potential costs and benefits of real estate * control and minimize real estate costs * analytical focus	* awareness of technical building costs * reducing square meters * presence of statements related to sustainability goals, but not made explicit in plans
Dealmaker	* strategic focus is made explicit in plans * real estate department communicates regularly with senior management * real estate department behaves proactively and comes up with new ideas	* physical environment optimal for faculties * analyses of user satisfaction * real estate department works together with faculties to identify the optimal space needs * standardisation real estate usage	* presence of financial tools and systems * balancing real estate costs against increasing costs of primary process * internal costing of real estate costs * analysing and documenting sources of market value	* basic inventory routines on real estate * focus on sustainability is made explicit in plans * analysis of physical aspects real estate portfolio * presence of maintenance plans * preventive maintenance
Intrapreneur	* full implementation or ongoing execution of strategic plans * long-term strategic planning * real estate department works closely together with senior management * matching the real estate department's strategy to its competitors' * real estate department coordinates plans with other support services	* overview of space use * overview of occupancy rates and frequency rates of real estate * real estate department works closely together with faculties and is involved in faculties' strategic planning processes * proposing real estate data and alternatives to faculties	* balancing real estate costs against optimising and increasing productivity * proving importance real estate through measurable results * real estate department acts as profit center * presence of financial controllers within the real estate department * long-term financial planning * scenario and risk planning	* full implementation or ongoing execution of sustainability plans * full implementation or ongoing execution of maintenance plans * proposing innovative and sustainable solutions * overview of real estate's energy performance * long-term maintenance planning
Business strategist	* generating future strategic plans for continuous improvement * high frequency of revising and adjusting real estate plans to match the changing demands * anticipating on trends, measuring and monitoring their impacts and contributing to the direction of the university as a whole * real estate department is closely aligned with senior management * real estate adds value to institutional goals and thereby improves the competitive advantage	* generating future plans to improve space use and thereby maximise efficiency * a state of the art learning and working environment * real estate department and faculties begin to regularly integrate space requirements and the real estate strategy into their joint initiatives * real estate adds value to the primary process and thereby improves the productivity * anticipating on trends, measuring and monitoring their impacts	* high frequency of revising and adjusting financial plans to match the strategic plans and changing demands * willingness to invest a larger amount of money in projects which create added value on the long-term *(balance between financial value, risks &costs and added value)* * real estate adds value to financial goals and thereby improves the profitability * real estate department is closely aligned with CFO * anticipating on trends, measuring and monitoring their impacts	* generating future sustainability plans for continuous improvement * willingness to keep outdated buildings which create added value in other aspects *(balance between physical condition and added value)* * real estate adds value to sustainability goals and thereby improves the sustainable development * anticipating on trends, measuring and monitoring their impacts

Table 8.3 – Assessment of development stage from real estate perspectives

CUBICUS BUILDING, UNIVERSITY OF TWENTE
PHOTO: UT

CHAPTER 9 – UNIVERSITY OF TWENTE

9.1 INTRODUCTION

University of Twente (UT) is the third Dutch university of technology, next to Delft University of Technology and Eindhoven University of Technology. With five faculties and several research institutes, UT accommodates over 10.000 students, 1.700 scientists and 1.300 support and management staff (Universiteit Twente, n.d.-a). UT is one of the youngest Dutch universities, and was founded in 1961 as '*Technische Hogeschool Twente*'. The current name, University of Twente, was established in 1986. UT is one of the smallest Dutch universities in terms of student numbers. UT has a large real estate portfolio, with 58 buildings occupying over 300.000 square meters gross floor area (UT, n.d.-a). Most of the university buildings were constructed between (den Heijer, 2011). Table 9.1 presents facts and figures of University of Twente.

Education	
Bachelor programmes	20
Master programmes	37
Student population	10.435
PhD students	538
First year students	3.432
Master degrees	1.467
Research	
Professors (FTE)	135,6
Publications	2.266
Promotions	197
Valorisation	
Start-ups	1.000
Patents in portfolio	
Personnel	
Scientific staff (FTE)	1.586
Scientific staff (headcount)	1.737
Supporting staff (FTE)	1.121
Supporting staff (headcount)	1.336
Finances	
Government funding	201,3 M€
Tuition fees	24 M€
Contract based research	74,4M€

Table 9.1 – Facts and figures University of Twente 2017 (University of Twente, n.d.-a)

UNIVERSITY OF TWENTE.

Figure 9.1 – Logo University of Twente (https://www.utwente.nl/organisatie/huisstijl/templates_en_downloads/#huisstijl)

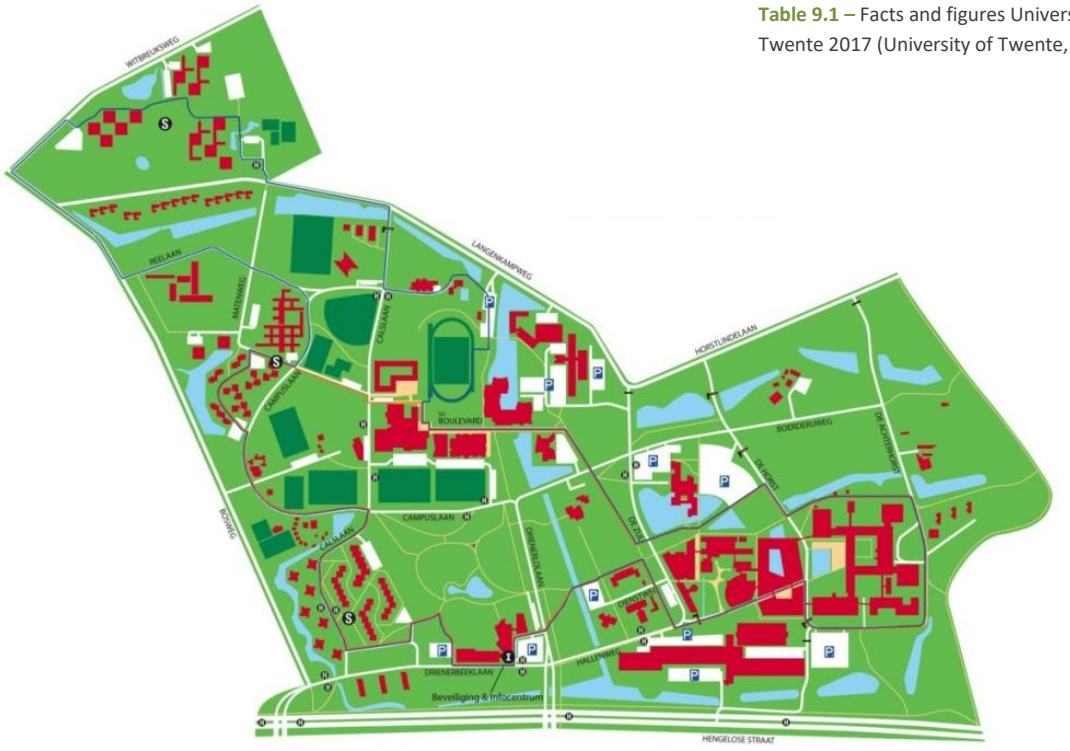


Figure 9.2 – Campus University of Twente (https://www.utwente.nl/nieuws/!/2014/11/343319/campusroute)

9.2 ORGANISATIONAL STRUCTURE

The organisational structure of University of Twente is discussed in Chapter 5. An detailed analysis of the organisational structure can be found in Appendix IV.

9.3 UNIVERSITY REAL ESTATE MANAGEMENT

UT's real estate management process is analysed in the following section by using the analytical framework discussed in Chapter 4. UT's real estate management process is assessed by the development stage of the real estate department – *task manager, controller, dealmaker, intrapreneur,* and *business strategist* – from each CREM perspective – *strategic, functional, financial,* and *physical*.

9.3.1 STRATEGIC PERSPECTIVE

Strategic focus

The strategic focus of the M&RE department is visible through the department's development and its strategic plans (see Figure 9.3).

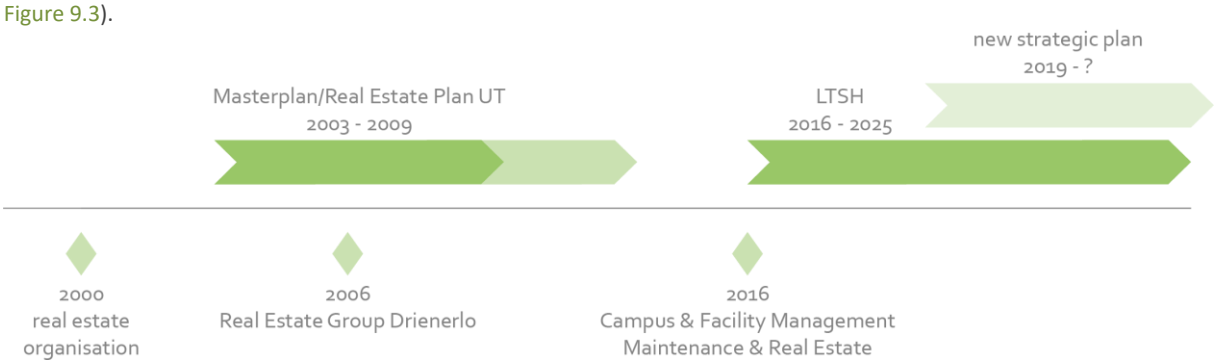


Figure 9.3 – Overview of development of real estate department and its strategic plans in the last two decades (own ill.)

After the decentralisation of university real estate from the Dutch government in 1995, the University of Twente was confronted with a real estate portfolio with outdated buildings, while being unexperienced in the field of real estate management and without a real estate organisation (UT, personal communication, May 1, 2019). The university hired several external parties to cope with this new real estate challenge (UT, personal communication, May 1, 2019). In 2000, the university established an internal real estate organisation, because it turned out that the Facility Services department was not equipped for the real estate challenge, as it involved investments of millions of euros (UT, personal communication, May 1, 2019).

In 2003, the first long-term housing plan was created, which was called the Masterplan/Real Estate Plan UT (UT, personal communication, May 1, 2019). The plan took into account student developments and research developments, and anticipated on both (UT, personal communication, May 1, 2019). Based on the plan, a lot of new construction projects have been realised (UT, personal communication, May 1, 2019). In 2006, a separate real estate project team was created: Real Estate Group Drienerlo (Dutch: *"Vastgoed Groep Drienerlo"*) (U-Today, 2006). The Executive Board created the separate unit to further develop and implement the Masterplan/Real Estate Plan UT (U-Today, 2006). The plan was designed for the period 2003-2009; however, the plan was not completed until 2012 (UT, personal communication, May 1, 2019). In 2012, after completion of the plan, the Real Estate Group Drienerlo was abolished (UT, personal communication, May 1, 2019).

At the end of 2013, the real estate department decided to renovate a vacant building for a new project (UT, personal communication, May 1, 2019). The renovation sparked the realisation that a new housing plan should be created (UT, personal communication, May 1, 2019). However, the Executive Board was not convinced this was necessary until 2016, once the financial implications of the renovation were considerably larger (UT, personal communication, May 1, 2019). In 2016, a new long-term housing plan was created: the Long-Term Housing Strategy (LTSH) (Dutch: *"Lange Termijn Strategie Huisvesting"*) (UT, personal communication, May 1, 2019). The LTSH was created for two reasons: the renovation of a vacant building and moving the faculty ICT from the inner-city of Enschede to the campus (UT, personal communication, May 1, 2019). The plan is designed for the period 2016-2025; however, the plan is already outdated, as it only evolves around these two major projects (UT, personal communication, May 1, 2019). The real estate department is therefore currently creating a new long-term housing plan (UT, personal communication, May 1, 2019). In 2016, the Executive Board also created a new real estate organisation – Maintenance & Real Estate – which is part of a new central services department – Campus & Facility Management (UT, personal communication, May 1, 2019).

In addition to the long-term real estate strategies discussed above, the real estate department also creates annual real estate plans (UT, personal communication, May 1, 2019). The annual plans give an update of current projects, and provides an overview of projects planned form the coming years (Universiteit Twente, 2016a). The annual plans also elaborate on the financial situation of the university, and determines the investment budget for the coming years (UT, 2016a).

In 2014, UT has created a new strategic plan: Vision 2020 (UT, n.d.-c). In this strategic plan, the university expresses an ambition on how the campus should function in 2020: "In 2020, the campus will be further developed into an inspiring, international learning environment, where theory has been put into practice, with state-of-the-art learning facilities" (UT, n.d.-c, p. 64). However, the strategic plan does not elaborate on this ambition, nor does it express any other ambition related to the campus and real estate of the university. Currently, the university is designing a new strategic plan: Shaping 2030 (UT, n.d.-b; UT, personal communication, May 1, 2019). Similar to Vision 2020, the strategic plan Shaping 2030 will not include many specific ambitions related to the campus and real estate of UT (UT, personal communication, May 1, 2019). The plan Shaping 2030 will include more ambitions related to sustainability (UT, personal communication, May 1, 2019).

The real estate department tries to align the real estate policy and plans with the strategic plans of the university (UT, personal communication, May 1, 2019). As the strategic plans of the university do not include specific ambitions for UT's campus and real estate, the real estate strategic plans are created independently (UT, personal communication, May 1, 2019). Such a plan leads to many discussions, especially since real estate is an subject of discussion that everyone is interested in and everyone has a specific opinion about (UT, personal communication, May 1, 2019). To reduce those discussions, it is important to create a solid strategic plan to which all real estate decisions and real estate interventions can be traced back to (UT, personal communication, May 1, 2019).

Communication and collaboration Executive Board

The real estate department regularly communicates with the Executive Board through its program team and steering committee (UT, personal communication, May 1, 2019). The program team real estate and the steering committee real estate have monthly meetings (UT, personal communication, May 1, 2019). If necessary, the program team and steering committee communicate issues or problems with the Executive Board, which then will discuss the real estate issues and problems during the weekly meetings of the Executive Board (UT, personal communication, May 1, 2019).

Anticipating on trends

The real estate department monitors all developments related to the university and its real estate on national, regional and university level (UT, 2016a). The M&RE department anticipates on these developments by incorporating them into its strategic plans. On university level, the real estate department closely monitors developments regarding the number of users, and developments regarding the needs of the users (UT, 2016a). On national and regional level, the real estate department monitors developments regarding political discussions about real estate investments, developments regarding municipal zoning plans (such as zoning plan Kennispark and Masterplan Kennispark), and developments regarding sustainability (UT, 2016a).

To conclude, UT's real estate department can be positioned at the *Dealmaker* stage of the five development stages of Joroff et al. (1993). The strategic real estate plans, the long-term focus of these plans, and the development of the real estate department show that the department has a strategic focus. However, the plans do not cover all aspects of the real estate portfolio; the first plan only focused on new construction projects, and the second plan only focuses on two real estate interventions. The current strategic plan – LTSH – is designed up until 2025, but is already outdated. The strategic real estate plans are not aligned to the universities strategic plans, as the university's plans do not include many specific ambitions related to the campus and real estate.

9.3.2 FUNCTIONAL PERSPECTIVE

Communication and collaboration with faculties

The real estate department communicates regularly with the faculties through its portfolio manager (UT, personal communication, May 1, 2019). The portfolio manager can be considered the account manager of the faculties; the portfolio manager communicates with the operational management directors of the faculties, and sometimes also with the deans (UT, personal communication, May 1, 2019). The operational management directors collect all real estate demands and wishes of the faculties, and communicates that with the portfolio manager (UT, personal communication, May 1, 2019). The portfolio manager communicates these demands and wishes with the program team, and the program team communicates these again with the steering committee (UT, personal communication, May 1, 2019). The portfolio manager also advices the operational management directors on the faculties' real estate (UT, personal communication, May 1, 2019). To conclude, the portfolio manager is the connecting link between the M&RE department and the faculties.

The faculties are indirectly involved in the real estate decision-making process through the Executive Board (UT, personal communication, May 1, 2019). As the directors of the faculties are directly involved with the Executive Board, the Executive Board communicates relevant issues to the program team and the steering committee if necessary (UT, personal communication, May 1, 2019).

Monitoring space use

The strategic plan LTSH provides overviews of UT's real estate, in which different aspects of the real estate portfolio are analysed (see UT, 2016b). One of these aspects is space use. Space use is an important indicator for the functional perspective, as it expresses the functionality of the real estate (den Heijer, 2011). The real estate departments monitors the space use in each spatial category, as shown in Figure 9.4).

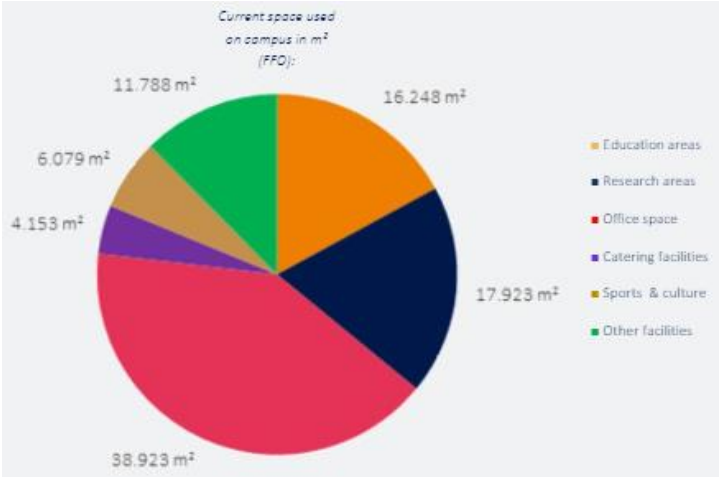


Figure 9.4 – Current space used on campus in m^2 (FFO) (UT, 2016b)

To conclude, the real estate department can be positioned at the third development stage of Joroff et al. (1993): the *Dealmaker* stage. The functional demands are determined by the users and are communicated with the portfolio manager. In addition to collecting user demands, the portfolio manager also knows what the functional and financial possibilities are and what the future vision of UT's real estate is, which makes the portfolio manager a significant asset of the real estate department. The connecting role of the portfolio manager shows that the real estate department considers it important to match real estate with user demands.

9.3.3 FINANCIAL PERSPECTIVE

Financial controllers

The relevant stakeholders from the financial perspective are the financial controllers of the university (den Heijer, 2011). UT has financial controllers on different levels in the organisation. The university has a central financial department – Finance – that is responsible for the real estate finances at university level (UT, personal communication, May 1, 2019). The C&FM department also has a financial department: Finance & Control (UT, personal communication, May 1, 2019). The M&RE department also has its own financial controller: the financial administrator, who works for the Information Management department (UT, personal communication, May 1, 2019). The financial administrator of the M&RE department is responsible for the internal costing of UT's real estate. The head of department Finance & Control and the financial administrator are responsible for the real estate finances at the level of the real estate department (UT, personal communication, May 1, 2019).

Recently, the central Finance department has been reorganised (UT, personal communication, May 1, 2019). Following from the reorganisation, a new financial controller function has been created that is responsible for the real estate control (UT, personal communication, May 1, 2019). The new financial controller works for the central Finance department, but is delegated to the real estate department (UT, personal communication, May 1, 2019). The new financial controller works with the portfolio manager, and together they are responsible for making the real estate reports (UT, personal communication, May 1, 2019).

Financial tools and systems

The real estate department keeps a close look on its real estate finances. The real estate department creates long-term financial plans, which are incorporated into the strategic plans (see UT, 2016a; UT, 2016b; UT, n.d.-b). The real estate department evaluates its housing initiatives within the financial frameworks of the university, formulates a long-term financial outlook, and formulates financial risks (UT, 2016b).

To stimulate the faculties to use their space efficiently and make the faculties aware of the real estate costs, the real estate department charges the faculties for their housing (UT, personal communication, May 1, 2019). The faculties pay a competitive rate for their housing; they pay a certain amount per square meters per year (UT, personal communication, May 1, 2019). These rental prices can be quite high, which is why the real estate department is very transparent towards the faculties on how these prices are made up. Being transparent about the prices, avoids discussions with faculties (UT, personal communication, May 1, 2019). However, there is still discussions about the rental prices sometimes; the faculties

find the rents too high (UT, personal communication, May 1, 2019). The rental prices per room type is different, for example, a laboratory has higher rental prices than a storage room. However, no distinction is made in the age of the buildings (UT, personal communication, May 1, 2019). The upside of this internal costing system is that the users are well aware of the costs of their real estate and use it more efficiently. Also, the faculties are less likely to ask for more or for things they do not necessarily need, since they are the ones who need to pay for it (UT, personal communication, May 1, 2019). If necessary, the faculties can also save money on their space use (UT, personal communication, May 1, 2019). For example, the faculties can choose to use less space; the remaining space will then become temporarily vacant (UT, personal communication, May 1, 2019).

To conclude, UT's real estate department can be positioned at the *Intrapreneur* stage of the five development stages of Joroff et al. (1993). Consideration underlying the determination of the position include the presence of financial controllers on multiple levels within the organisation, and the use of financial tools and systems, such as long-term financial plans, the financial budget and the internal costing system.

9.3.4 PHYSICAL PERSPECTIVE

Maintenance

The real estate department assesses the physical condition of UT's real estate every three years (UT, personal communication, May 1, 2019). The real estate department uses the NEN 2767 Condition Assessment for the Built Environment (UT, personal communication, May 1, 2019). NEN 2767 uses six condition scores, with 1 being 'excellent' and 6 being 'very poor' (UT, personal communication, May 1, 2019). The older building in UT's real estate portfolio are kept at condition level 3 'reasonable' (UT, personal communication, May 1, 2019). When buildings or building components are in condition level 4, the buildings or components will be renovated to get them back in condition level 3 (UT, personal communication, May 1, 2019). The physical condition of UT's buildings and building components are incorporated in the maintenance plans (UT, personal communication, May 1, 2019). By regularly assessing the physical condition, the real estate department knows exactly which buildings and building components need to be replaced or renovated, and when (UT, personal communication, May 1, 2019). The real estate department has used this system of assessing the physical condition of UT's real estate since 2010 (UT, personal communication, May 1,2019).

The physical condition of UT's real estate is also incorporated in the strategic plans of the real estate department (UT, personal communication, May 1, 2019). In addition to the physical condition, other aspects related to the quality and quantity are also taken into account, such as energy consumption and sustainability (UT, personal communication, May 1, 2019). The real estate department tries to align the strategic real estate plans and the maintenance plans (UT, personal communication, May 1, 2019). According to the director of the M&RE department, these plans need to be better aligned, as it is currently not well aligned (UT, personal communication, May 1, 2019). Before 2016, real estate maintenance and real estate construction were separated services (UT, personal communication, May 1, 2019), which could possible explain why the services are not well aligned. Real estate maintenance has been part of the real estate department since the creation of the real estate organisation in 2000 (UT, personal communication, May 1, 2019). However, real estate construction was part of the Real Estate Group Drienerlo, which was an individual organisational unit (UT, personal communication, May 1, 2019). With the reorganisation in 2016, the two services have been joint together in one department (UT, personal communication, May 1, 2016). The director of the M&RE department thinks these two services should be joint into one department, so that there is one director that controls both services and ensures that the services work together (UT, personal communication, May 1, 2019).

Sustainable development

UT has a strong focus on sustainability, which is visible through its plans and agreements. The UT has signed the Long-Term Covenant Agreement on Energy Efficiency, which is an agreement with the Dutch government to improve the energy efficiency of products, services and processes (Universiteit Twente, 2019b). The aim is to cut energy consumption by 30% in the period 2005-2020. The 30% is divided into a 20% reduction on campus and 10% reduction in the chain (UT, n.d.-d; UT, 2019b).

In 2013, the UT has created a new sustainability plan: the Energy Efficiency Plan (EEP) (UT, 2019b). The EEP was designed for the period 2013-2016 (UT, 2019b). In 2017, a new EEP was designed for the period 2017-2024 (UT, n.d.-a). The EEP will be updated every four years (UT, 2019b). The EEP provides insight into the university's energy situation and energy saving options (UT, 2019b).

The university closely monitors the energy performance of its real estate portfolio. Figure 9.5 shows UT's energy consumption of the last two decades. The blue line in the figure represents the agreement with the Dutch government to cut energy consumption by 30%. As can be seen in the figure, the university is on track to accomplish the 30%. All energy savings up until now are accomplished by focusing on making the real estate properties more efficient by taking technical measurements (UT, 2019b; UT, n.d.-b). The university now turns it focus towards raising awareness (UT, 2019b). One of the measurements to raise awareness is publicly sharing data on the energy performance of the UT. The UT therefore publishes the data on energy performance online in an energy data platform (UT, 2019b). In this online energy data platform, all data

can be viewed and analysed (UT, 2019b). Figure 9.6 provides an overview of the energy performance of the UT for August 26, August 27 and August 28.

To conclude, To conclude, the real estate department can be positioned at the fourth development stage of Joroff et al. (1993): the *Intrapreneur* stage. The M&RE department has a strong focus on sustainable development, which is reflected in the department's plans, such as the Energy Efficiency Plan. The sustainability plans are regularly updated. Maintenance plans are also present, and are regularly revised and updated. The department has an overview of the physical condition of UT's real estate, and updates this data every three years. The real estate department tries to align the maintenance plans with the strategic plans. However, this alignment could be improved.

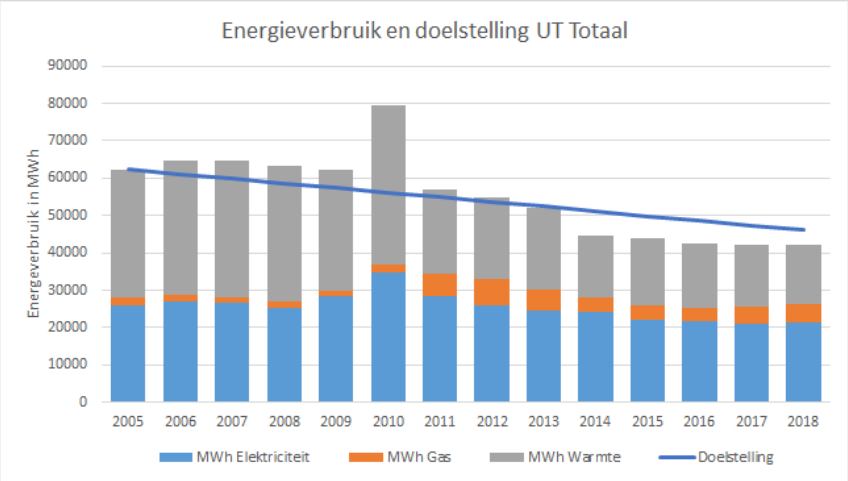


Figure 9.5 – Energy consumption (UT, 2019b)

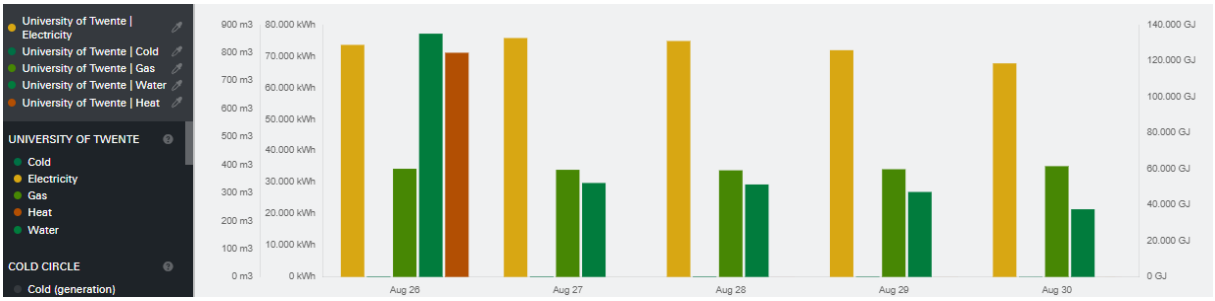


Figure 9.6 – Energy monitor (https://energydata.utwente.nl/)

9.3.5 ASSESSMENT UNIVERSITY REAL ESTATE MANAGEMENT

Table 9.2 summarises the analysis of UT's real estate management process.

	Strategic	Functional	Financial	Physical
	aligning real estate with institutional goals	aligning real estate with (primary) processes	aligning real estate financial value, risks and costs with production of products and services	maintaining quantity and quality of current and future real estate
Task manager	* supply in university's demand for real estate * senior management is involved with real estate department	* supply in faculties' demand for real estate * real estate enables students and researchers to produce knowledge	* supply in demand for real estate within budgets * real estate is viewed as neither a cost nor benefit	* supply in demand for real estate * provide general service on real estate as needed * corrective maintenance
Controller	* real estate department reports results to the senior management * presence of statements related to strategic goals, but not made explicit in plans	* physical environment optimal for primary process * analyses of primary processes * interaction and dialogue with faculties about their short- and long-term needs	* supply in demand for real estate at the lowest cost possible * awareness of potential costs and benefits of real estate * control and minimize real estate costs * analytical focus	* awareness of technical building costs * reducing square meters * presence of statements related to sustainability goals, but not made explicit in plans
Dealmaker	* strategic focus is made explicit in plans * real estate department communicates regularly with senior management * real estate department behaves proactively and comes up with new ideas	* physical environment optimal for faculties * analyses of user satisfaction * real estate department works together with faculties to identify the optimal space needs * standardisation real estate usage	* presence of financial tools and systems * balancing real estate costs against increasing costs of primary process * internal costing of real estate costs * analysing and documenting sources of market value	* basic inventory routines on real estate * focus on sustainability is made explicit in plans * analysis of physical aspects real estate portfolio * presence of maintenance plans * preventive maintenance
Intrapreneur	* full implementation or ongoing execution of strategic plans * long-term strategic planning * real estate department works closely together with senior management * matching the real estate department's strategy to its competitors' * real estate department coordinates plans with other support services	* overview of space use * overview of occupancy rates and frequency rates of real estate * real estate department works closely together with faculties and is involved in faculties' strategic planning processes * proposing real estate data and alternatives to faculties	* balancing real estate costs against optimising and increasing productivity * proving importance real estate through measurable results * real estate department acts as profit center * presence of financial controllers within the real estate department * long-term financial planning * scenario and risk planning	* full implementation or ongoing execution of sustainability plans * full implementation or ongoing execution of maintenance plans * proposing innovative and sustainable solutions * overview of real estate's energy performance * long-term maintenance planning
Business strategist	* generating future strategic plans for continuous improvement * high frequency of revising and adjusting real estate plans to match the changing demands * anticipating on trends, measuring and monitoring their impacts and contributing to the direction of the university as a whole * real estate department is closely aligned with senior management * real estate adds value to institutional goals and thereby improves the competitive advantage	* generating future plans to improve space use and thereby maximise efficiency * a state of the art learning and working environment * real estate department and faculties begin to regularly integrate space requirements and the real estate strategy into their joint initiatives * real estate adds value to the primary process and thereby improves the productivity * anticipating on trends, measuring and monitoring their impacts	* high frequency of revising and adjusting financial plans to match the strategic plans and changing demands * willingness to invest a larger amount of money in projects which create added value on the long-term *(balance between financial value, risks &costs and added value)* * real estate adds value to financial goals and thereby improves the profitability * real estate department is closely aligned with CFO * anticipating on trends, measuring and monitoring their impacts	* generating future sustainability plans for continuous improvement * willingness to keep outdated buildings which create added value in other aspects *(balance between physical condition and added value)* * real estate adds value to sustainability goals and thereby improves the sustainable development * anticipating on trends, measuring and monitoring their impacts

Table 9.2 – Assessment of development stage from real estate perspectives

CHAPTER 10 – CROSS-CASE ANALYSIS

In the following chapter, the findings of the four case studies presented in Chapters 6 to 9 are combined and compared in a cross-case analysis. The cross-case analysis follows the analytical framework presented in Chapter 4. The subsections in this chapter start with an overview of the results of the case studies, then similarities and differences between the different cases are described, and possible explanations for the findings are discussed.

10.1 ORGANISATIONAL STRUCTURE

Figure 10.1 visualises the analysis of the organisational structure of the four Dutch universities.

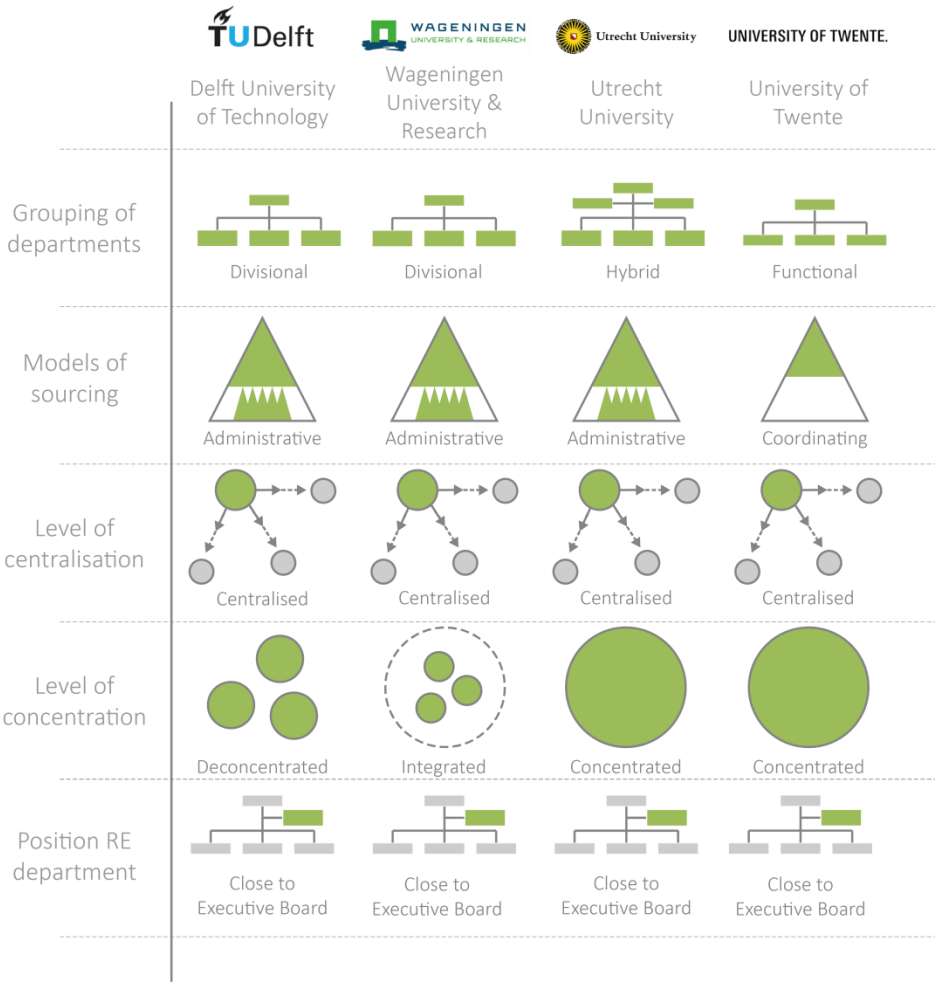


Figure 10.1 – Analysis Organisational Structure of the four Dutch universities (own illustration)

10.1.1 GROUPING OF DEPARTMENTS

Figure 10.2 shows the grouping of departments of the four Dutch universities. The figure illustrates that both TU Delft and WUR have a divisional structure, while UU has a matrix structure, and the UT a functional structure.

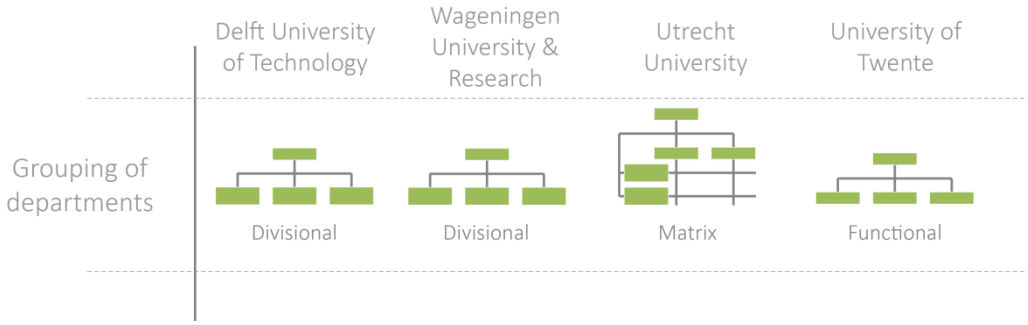


Figure 10.2 – Grouping of departments of the four Dutch universities (own illustration)

Possible explanations for findings

Considering university organisation are Professional Bureaucracies, the distinction between functional and divisional structure breaks down (Mintzberg, 1979). Although TU Delft and WUR are described as divisional, the structures can also be described as functional. The same goes for UU; the organisation can be described as functional, but also an divisional. Section 5.1.1 goes into detail on this distinction.

UU decided to use a different approach to grouping its department. UU's real estate department has a matrix structure: their organisation is a combination of a divisional and a functional structure. The use of this structure could possible attributed to the importance of both functions and divisions. A matrix model is often used when functions and divisions are equally important (Daft, Murphy & Willmot, 2010). This possible explanation is supported by the results of the case study of UU. With the reorganisation of the real estate department in 2018, the real estate department decides to create two staff departments – Finance & Control and Safety & Environment – to ensure a more independent position of these two functions. This shows that these departments are equally important as the other services provided by the real estate department.

> *"The position as staff department instead of line department ensures a more independent position. (…). The position as staff department benefits the university-wide role that M&RE has (…)." (UU, personal communication, April 5, 2019)*

10.1.2 LEVEL OF CENTRALISATION

Figure 10.3 shows the level of centralisation of the four Dutch universities. The figure illustrates that all four universities have a centralised real estate decision-making process.

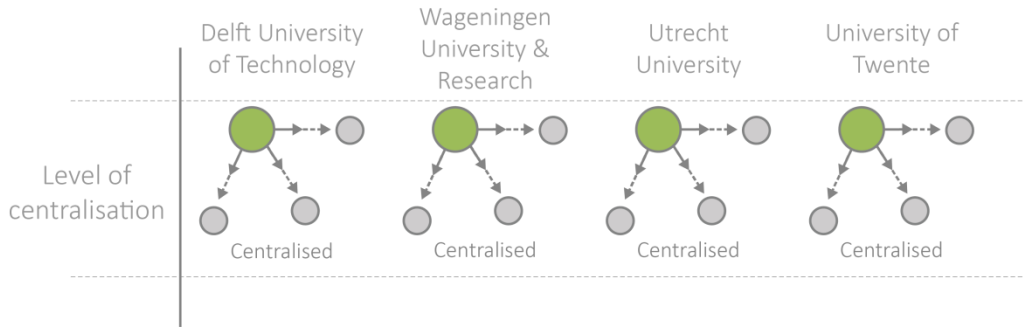


Figure 10.3 – Level of centralisation of the four Dutch universities (own illustration)

Figure 10.3 might not give a fair representation of reality; in reality, a university organisation is never completely centralised or completely decentralised. The level of centralisation is much more complex, as the real estate department has to report to and needs approval from higher levels in the organisation, and lower levels in the organisation also have an influence on the decision-making process. The decision-making powers of the real estate department are determined by the mandate regulations of the university. The faculties are highly decentralised organisational units, and therefore also have an influence on their housing. Therefore, Table 10.1 provides a more detailed analysis of the level of centralisation of the four universities.

	Delft University of Technology	Wageningen University & Research	Utrecht University	University of Twente
Level of centralisation	Centralised	Centralised	Centralised	Centralised
Levels of decision-making	Department CRE Real estate department University Corporate Office Executive Board	Real estate department Facilities & Services Executive Board	Head of department CRE&C Department manager CRE&C Real estate department Executive Board	Program team RE Steering committee RE Executive Board
Decision-making authority - Mandate Regulations	Director CRE * renting or leasing TU Delft's properties to third parties up to €50.000 * rental agreements with a commitment of three years or less * agreements regarding the renovation of existing real estate insofar the total budget is not exceeded * maintenance agreements insofar the total budget is not exceeded * measures regarding TU Delft's real estate regarding safety and environmental aspects	Director Facilities & Services * renting or leasing WUR's properties to third parties Executive Board * agreements with regard to the construction of real estate * agreements with regard to the purchase or sale of real estate	Director CRE&C * renting or leasing UU's properties up to €500.000 * real estate interventions regarding asbestos and concrete degradation up to €250.000 * real estate interventions that overrun the budget up to €250.000 or 5% of the total budget * real estate projects in the initiation phase up to €100.000 * functional interventions of real estate properties up to €250.000 per property per year	-
Decision-making authority - Investment costs	* Department manager CRE ≤ € 25.000 * Director CRE ≤ € 150.000 * Director University Corporate Office ≤ € 1.000.000 * Executive Board ≥ € 1.000.000	-	* Head of department CRE&C ≤ € 100.000 - ≤ € 1.000.000 * Department manager CRE&C ≤ € 500.000 - ≤ € 1.000.000 * Director CRE&C ≤ € 2.000.000 * Executive Board ≤ € 2.000.000	-

Table 10.1 – Cross-case analysis: level of centralisation (own ill. based on case studies)

All four universities have chosen to centralise their real estate decision-making process, and place the responsibilities, accountability and decision-making powers within a central place in the organisation. However, how centralised each organisation is, is different for each of the four universities.

At TU Delft and WUR, the central services department also has real estate decision-making powers. This means that the director of the real estate department first goes the director of the central service department for approval. For TU Delft this department is the University Corporate Office; for WUR this is the Facilities & Services department. If the decision is outside the central service department's mandate, the decisions needs to be approved by the Executive Board. At UU, the central services department – the University Corporate Office – has no decision-making powers; the real estate department directly reports to and needs approval from the Executive Board. At UT, the real estate decision-making process is different: a special program team and steering committee are created to make decisions.

The real estate departments of TU Delft and UU have similar decision-making authorities, according to their university's mandate regulations. Both department can make decisions regarding renting and leasing properties and real estate interventions regarding safety and environment. The difference between the two departments is the maximum amount of money invested in those decisions. TU Delft's real estate department can only make decisions insofar the total budget is not exceeded; if it is exceeded, the department needs approval from the Executive Board. UU's real estate department can make decisions that overrun the budget up to €250.000 or 5% of the total budget. The maximum investment costs of projects is also different for both departments: the director of UU's real estate department can make decisions up to €2.000.000, while the director of TU Delft's real estate department can make decisions up to €1.000.000. The department managers and heads of department have more decision-making authority: the department managers of TU Delft can make decisions up to €25.000, while the heads of department of UU can make decisions between €100.000 and €1.000.000, depending on the department. Thus, the real estate department of UU has more decision-making powers than the real estate department of TU Delft.

The mandate regulations of WUR and UT do not elaborate on the mandate of the real estate department. Thus, either the real estate department has no mandate at all, and needs approval for all real estate decisions from higher levels in the organisation; or the real estate department does have little mandate, but it is just not elaborated on. The latter option is most likely. Since this information is unknown, no conclusions will be drawn from these two cases.

Possible explanations for findings

All four universities have chosen to centralise the real estate decision-making powers. The decision to centralise these powers could be attributed to a strong focus on institutional objectives and goals. A centralised structure puts more focus on institutional goals and objectives (Bank & den Heijer, 2004). At decentral level the focus on institutional objectives and goals is less; the focus is more on faculty objectives and goals (Bank & den Heijer, 2004). Another explanation for a centralised organisation is found in the case study of WUR. Around twelve years ago, WUR has decided to create a central services department to provide customers and users all support services in a similar matter:

> *"The Executive Board has decided to integrate Wageningen UR's remaining decentralised facility services in the Facilities department, an organisational change that is expected to result in uniform services and an uninterrupted facilities and, ultimately result in the provision of improved services to customers and users" (WUR, n.d.-d, p. 43)*

Although all four universities have centralised their real estate decision-making authority, several differences can be observed in how centralised the real estate departments really are. These differences can possible be attributed to the size of the real estate portfolios, the size of the real estate departments, and the available financial resources. TU Delft and UU have the largest real estate portfolios of all Dutch universities, which explains why both real estate department are rather large: the real estate department of TU Delft has around 200-250 employees, and the real estate department and the Facility Services department of UU have around 290 employees (TU Delft, personal communication, February 25, 2019; UU, personal communication, April 5, 2019). Both departments are the largest support services of their university. Both universities are also planning to invest large amount of financial resources in their real estate portfolio in the coming years. Considering the size of the real estate departments and the complexity and scale of their activities, a certain decision-making authority seems necessary.

10.1.3 LEVEL OF CONCENTRATION

Figure 10.4 shows the level of concentration of the four Dutch universities. The figure illustrates that all four universities have a different approach to where to concentrate the real estate activities within the organisation. UU and UT have concentrated its real estate activities in a central place in the organisation, TU Delft have deconcentrated its real estate activities, and WUR has integrated all its support services into a shared service center.

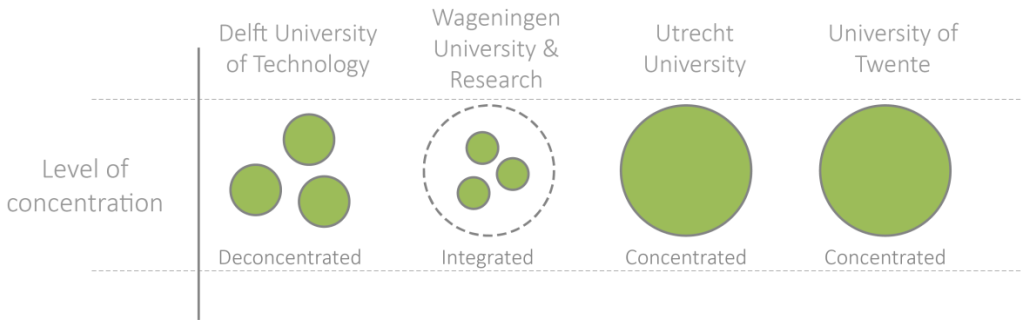


Figure 10.4 – Level of concentration of the four Dutch universities (own illustration)

Possible explanations for findings

TU Delft is the only organisation that deconcentrates its real estate activities; WUR, UU and UT concentrate their activities in a central place, and WUR even integrates all its support services in a shared service center. The difference in level of concentration may be ascribed to the presence of a real estate department at faculty level. TU Delft's faculties are highly decentralised and have their own real estate department as part of their support services. The faculties of the other three universities are also decentralised; however, they do not have their own real estate department. It would be logical to deconcentrate real estate activities to real estate departments at faculty level, as this ensures a better alignment of the real estate services and the primary process (Bank & den Heijer, 2004).

Another explanation for the differences could be attributed to the focus of the university and how it wants to presents its supporting services. If a good alignment with the primary process is desired, a university could choose to deconcentrate its real estate activities (Bank & den Heijer, 2004). If a good alignment with university objectives and goals, and economies of scale are desired, a university could choose to concentrate its real estate activities (Bank & den Heijer, 2004). If a university focuses on providing uniform services and uninterrupted facilities, in addition to achieving economies of scale and a good alignment with university objectives and goals, a university could choose to integrate all support services in a shared service center. The latter statement is supported by the analysis of the case study of WUR. WUR is the only university of the four that specifically states that it wants to provide uniform services and uninterrupted facilities, which ultimately will result in the provision of improved services (WUR, n.d.-c).

10.1.4 LEVEL OF SOURCING

Figure 10.5 shows the level of sourcing of the four Dutch universities. The figure illustrates that TU Delft, WUR and UU all use an administrative model for sourcing, and UT uses a coordinating model.

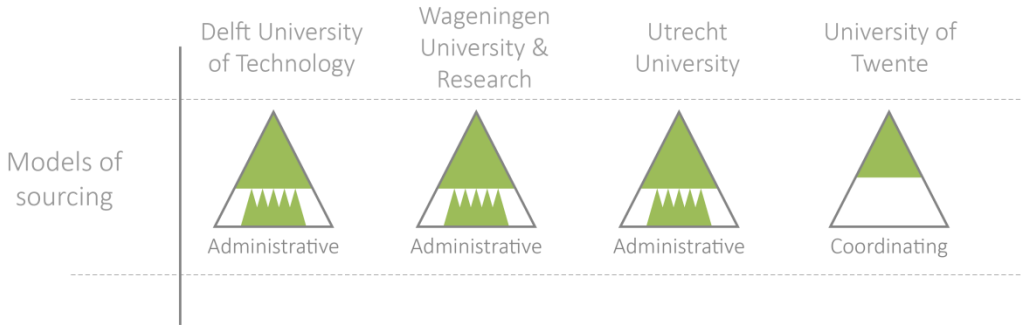


Figure 10.5 – Level of sourcing of the four Dutch universities (own illustration)

The real estate departments of TU Delft and UU both decided to keep most real estate management activities in-house. Certain operational management activities are outsourced, but never completely. For example, UU only outsources activities if the real estate department lacks enough personnel or knowledge and expertise; the department then hires external parties for their expertise:

> *"(…) activities are indeed outsourced, but these [activities] only concern capacity issues. (…) however, activities are never completely outsourced. [for example,] we do not completely outsource our maintenance, but we do hire external parties for their expertise." (UU, personal communication, April 5, 2019)*

In contrast to TU Delft and UU, the real estate department of WUR does completely outsource certain operational management activities. When outsourcing certain activities, the department remains responsible for coordinating and directing, but the operation is completely outsourced. This way of sourcing only applies to certain operational real estate activities; not all operational activities are outsourced. Examples of outsourced activities are construction management and housing management:

> *"The Construction & Housing Management department really has a directing role: the department does not perform operational tasks, apart from the technical manager and the construction team; we have outsourced everything. We are responsible for the coordinating and directing of the activities, external parties are responsible for the operation." (WUR, personal communication, March 22, 2019)*

The real estate department of UT is the only one of the four universities that completely outsourced its operational management activities and part of its tactical management activities. The real estate department uses contract managers to manage the contracts and relationships with the external service providers.

Possible explanations for findings

The differences in level of sourcing could be ascribed to the complexity of university real estate management. University real estate management is complex process and an unique field of knowledge; external service providers often do not have such specific knowledge and skills. (Janssen, 2008). Due to this complexity, keeping most real estate management activities in-house seems logical.

The differences can also be attributed to the focus of the real estate department. When outsourcing real estate management activities, the department can better focus on aligning real estate with institutional objectives and goals, and user demands (Bank & den Heijer, 2004). However, the real estate department also loses a certain control over its activities.

10.1.5 POSITION OF REAL ESTATE DEPARTMENT

Figure 10.6 shows the position of the real estate department of the four Dutch universities. The figure illustrates that all four universities have located its real estate departments close to the Executive Board.

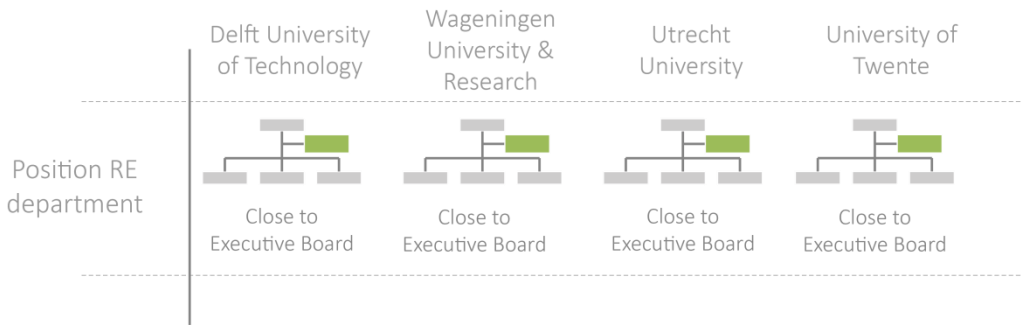


Figure 10.6 – Position of the real estate department of the four Dutch universities (own illustration)

Although all real estate departments have a high position in their organisation, differences are observed in how close the departments are to their Executive Boards. As already discussed in subsection 10.1.2., all four departments have different real estate decision-making powers. The real estate departments of WUR and UT have little mandate compared to the departments of TU Delft and UU.

Possible explanations for findings

The possible explanation for the differences in decision-making authority is already discussed in subsection 10.1.2.

10.2 UNIVERSITY REAL ESTATE MANAGEMENT

Figure 10.7 visualises the analysis of the real estate management processes of the four Dutch universities.

Figure 10.7 – Analysis University Real Estate Management of the four Dutch universities (own illustration)

10.2.1 STRATEGIC PERSPECTIVE

Figure 10.8 shows the strategic perspective of the real estate management processes of the four Dutch universities. The figure illustrates that the real estate departments of TU Delft and WUR can be positioned at the fifth stage of Joroff et al. (1993): the Business Strategist. The real estate department of UU can be positioned at the Intrapreneur stage; and the University of Twente at the Dealmaker stage. Table 10.2 summarises the results of the case studies.

Figure 10.8 – Strategic perspective of the real estate management processes of the four Dutch universities (own illustration)

As described in the table, all four universities have reorganised their real estate organisation in the past decade. The reorganisations of TU Delft, UU and UT were specifically focused on the real estate management services; the real estate management processes were the reason to reorganise. The reorganisation of WUR was focused on all central supporting services. The reorganisation show that all four universities are thinking on a strategical level about their real estate management services and how the organisational structure can better support these services.

All four universities currently have real estate plans in which the strategic focus is made explicit. The real estate departments of TU Delft and WUR have continuously created real estate plans in the past, and their current plans have a long-term vision. Both real estate departments anticipate of trends and incorporate future developments in their strategic plans, and are already planning the design of future plans. The departments frequently revises and adjusts their plans to the changing context. The real estate department of UU designed its first real estate plan in 2017; this plan has a long-term vision and is designed for a period up until 2027. The plan is currently being implemented. The real estate department of UT has created one major real estate plan in the past, which was designed and implemented for the period 2003-2012. A new real estate plan was created only in 2017. The current plan is designed for the period 2017-2025, but is already outdated as it only focused on two major real estate interventions.

Possible explanation for findings

The differences between the development stages of the four real estate department could be attributed to the separation of the strategical and operational level. When separating the two levels, the knowledge and expertise on both levels are also separated, and it becomes more difficult to align operational tasks with strategical policy (Bank & den Heijer, 2004). This possible explanation is supported by the case study analyses. UT is one of the first universities that created a real estate department, and that started designing strategic real estate plans. However, the strategical level and operational level have been separated until the reorganisation in 2017. Before 2017, the real estate department only focused on maintaining its current real estate portfolio (operational), and an individual real estate organisation – Real Estate Group Drienerlo – focused on new construction projects (strategical and tactical). The separation of the two services is reflected in UT's real estate plans: the first plan only focused on new construction projects, and the current plan is designed based on only two real estate interventions.

Another possible explanation for the differences could be the focus of the Executive Board on its real estate management services. After the decentralisation of university real estate in 1995, all Dutch universities were confronted with a new challenge, one that all universities were unexperienced in at that time. The real estate portfolios consisted of outdated buildings that were in need of reinvestment. Several universities took an active role in facing this new challenge, and created a real estate department early on. TU Delft, WUR and UT are examples of these universities. However, some universities chose to take a passive role, and started making real estate plans once it became necessary. UU is one of these latter universities. In 2017, the university realised that it was necessary to focus on the qualitative and quantitative aspects of its real estate portfolio, and started developing its first major real estate plan.

	Strategic focus	Communication & collaboration senior management
Delft University of Technology	* the real estate department has several real estate plans. The most important is the real estate strategy. The current real estate strategy has a long-term vision; it was designed for the period 2016-2025. The plan is an example of a future strategic plan that is focused on continuous improvement of the real estate portfolio * the strategic plans of the university form the basis for the real estate plans: the university expresses its ambitions through its strategic plans, and the real estate department tries to match the real estate plans to these strategic plans. * in 2017, the university reorganised its real estate department. With this reorganisation, the services of real estate management and facility management are separated into two different department. The aim of this was to have one single department that can completely focus on the complex real estate challenges. This shows that the university is thinking on a strategical level about its real estate services and how they want to organise their organisation.	* the Executive Board has bilateral meetings twice a year with the director of the University Corporate Office and the directors of all supporting services. During these meetings, all real estate related issues are discussed and new plans for the coming year are presented. This shows that the real estate department regularly communicates with the Executive Board.
Wageningen University & Research	* a central supporting services department was created ±12 years ago to have uniform services and uninterrupted facilities and to provide improved services to customers and user. This shows that the university is *thinking on a strategical level* about offering its support services and how they want to organise their organisation. * the real estate department started designing real estate strategies before 2010. Several strategic plans have followed since then. During the implementation of a plan, the real estate department already anticipates on future developments, and starts designing a new strategic plan even before the previous plan is completed. The plans also have a long-term vision. The presence of these different plans indicate that the real estate department *generates future strategic plans for continuous improvement*, and that the department *anticipates on trends* and that the department *frequently revises and adjusts its real estate plans to match the changing demands*.	* bilateral relationship with Executive Board. The real estate department draws up and presents plans to the Executive Board and needs approval; the real estate department also proposes solution as input. The Executive Board also picks up real estate related signals from the organisational units and discusses these and consults with the real estate department. This shows that there is good coordination and alignment between the Executive Board and the real estate department: real estate department not only reports to the Executive Board, but also really proves its value by providing input and proposing solutions. The Executive does not only have a directing role but is also highly involved in the real estate management processes. This shows that the *real estate department and the Executive Board are closely aligned*.
Utrecht University	* the first strategic real estate strategy has been created in 2017. Before 2017, the real estate department probably had real estate plans, but at the scale of this real estate strategy. The first plan was created because the real estate department's awareness of necessary focus on qualitative and financial aspects of the real estate portfolio, and the limited financial resources of the real estate department. The strategic focus of the real estate department is thus made explicit in plans, and these plans are currently being implemented. * the strategic plans of the university form the basis for the real estate plans: the strategic plans of the university are translated and adapted into real estate plans * in 2018, the university reorganised its real estate department. The reason for the reorganisation was to make the real estate department more customer-oriented, rather than task-oriented, and to separate and join several department and functions in order to promote and stimulate collaboration and better results. This shows that the university is *thinking on a strategical level* about its real estate services and how they want to organise their organisation.	* the Executive Board monitors the strategic plans of the faculties and the University Corporate Offices by means of quarterly reports. The Executive Board also has periodic bilateral meetings with the faculties and the directors of the University Corporate Offices, including the director of the real estate department. The real estate department also works together with the Executive Board to create new strategic real estate plans. This shows that the real estate department works closely together with the Executive Board.
University of Twente	* the real estate organisation was created in 2000 and the first strategic real estate plan was designed in 2003 and completed in 2012. In 2013, the real estate department became aware that a new strategic plan was necessary. However, a new plan was created in 2017. This plan is based only on two major interventions. Currently, the plan is already outdated. Thus, real estate plans are present and being implemented, and are designed for a longer period. However, the current plans are already outdated. The real estate department already is working on new plans. The strategic focus is thus present, and is made explicit in plans. However, the new plans are not finished yet, and thus are not being implemented yet. * the strategic plans of the university do not include many ambitions related to real estate. The real estate plans are thus individual reports. This creates many discussions, as the real estate plans are not linked to institutional objectives and goals regarding real estate. * in 2016, a study was conducted into the organisational structure of a real estate department that optimally supports the real estate ambitions and one that better meets the demands of the Executive Board. The study resulted in the creation of a new department that consists of all campus related services, including a new real estate department. This shows that the university is *thinking on a strategical level* about its real estate services and how they want to organise their organisation.	* the program team real estate and the steering committee real estate have monthly meetings. If necessary, the program team and steering committee communicate issues or problems with the Executive Board, which then will discuss the real estate issues and problems during the weekly meetings of the Executive Board. This shows that the real estate department regularly communicates with the Executive Board.

Table 10.2 – Summary analysis case studies – strategic perspective (own table)

10.2.2 FUNCTIONAL PERSPECTIVE

Figure 10.8 shows the strategic perspective of the real estate management processes of the four Dutch universities. The figure illustrates that the real estate departments of WUR and UU can be positioned at the fourth stage of Joroff et al. (1993): the Intrapreneur. The real estate department of TU Delft can be positioned at the Business Strategist stage; and the University of Twente at the Dealmaker stage. Table 10.3 summarises the results of the case studies.

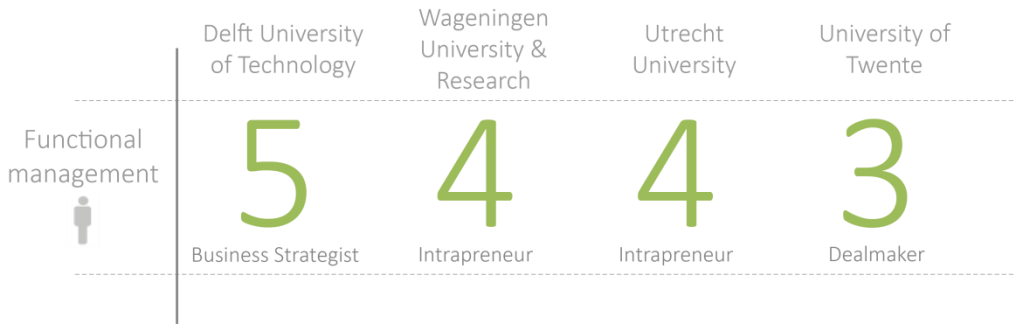


Figure 10.8 – Functional perspective of the real estate management processes of the four Dutch universities (own illustration)

	Communication and collaboration with faculties
Delft University of Technology	* bilateral relationship with faculties: the faculties are directly involved in the design of the real estate plans. The real estate department regularly collects user demands and analyses user satisfaction. The faculties discuss their demands with the real estate department. * faculties have their own real estate department as part of their supporting services. This real estate department is solely concerned with its faculty's real estate. * co-creation: The real estate department wants to create awareness among the faculties, and enable them to contribute to real estate solution by stimulating a sense of ownership
Wageningen University & Research	* bilateral relationship with organisational units. The real estate department creates and presents plans to the organisational units, and proposes solutions. The organisational units are the customers of the real estate department; they submit real estate projects to the real estate department and asks for advice regarding their housing. * short communication lines between real estate department and organisational units. * the real estate department collects user demands and analyses user satisfaction on a yearly basis * organisational units do not have their own real estate department as part of their supporting services; the units have location managers. The location managers are responsible for all supporting services of its organisational unit. The communication lines between the organisational units and the real estate department, and problems can be solved quickly.
Utrecht University	* bilateral relationship with faculties. The real estate department regularly collects user demands and analyses user satisfaction. The faculties are directly involved in all real estate projects and in the design of the real estate plans. The faculties are also involved in important decision-making moments of the real estate department. * the reorganisation of the real estate department was aimed at improving and strengthening the relationship with the faculties, and a better alignment of real estate and user demands * the faculties do not have their own real estate department as part of their supporting services; the faculties have demand managers. The demand managers are the representatives of the faculties, and are responsible for the smaller internal real estate projects of the faculties
University of Twente	* the faculties do not have their own real estate department as part of their supporting services. * the portfolio manager of real estate department regularly communicates with the faculties and collects user demands, and advises the faculties regarding their housing. The faculties are not directly involved in the real estate decision-making process

Table 10.3 – Summary analysis case studies – functional perspective (own table)

As described in the table, all four real estate departments regularly communication and collaborate with the users of their real estate. The real estate departments regularly collect user demands, analyse user satisfaction, and propose real estate solutions and alternatives. TU Delft, WUR and UU have a bilateral relationship with the users of their real estate: the users – faculties and organisational units – are directly involved in the design of the real estate plans and, in case of UU, also involved in the decision-making process.

The faculties and organisational units of TU Delft, WUR and UU are represented by either their own real estate department (TU Delft) or by a demand or location manager (WUR and UU). Figure 10.8 illustrates the level of concentration for each of

the four universities. The faculties of TU Delft have their own real estate department that is responsible for the operation of the real estate activities of its faculty. The central real estate department communicates with these departments, in addition to the directors and deans of the faculties. The organisational units of WUR have their own location managers, that are responsible for all supporting services of their organisational unit. The locations managers are delegated from the central Facilities & Services department – and thus not from the real estate department. The faculties of UU have their own demand managers that are the representatives of the faculties. The demand managers are delegated from the central real estate department. UT does not have an own real estate department, and is not represented by a location or demand manager. The connecting link between the faculties and the real estate department is the portfolio manager of the real estate department.

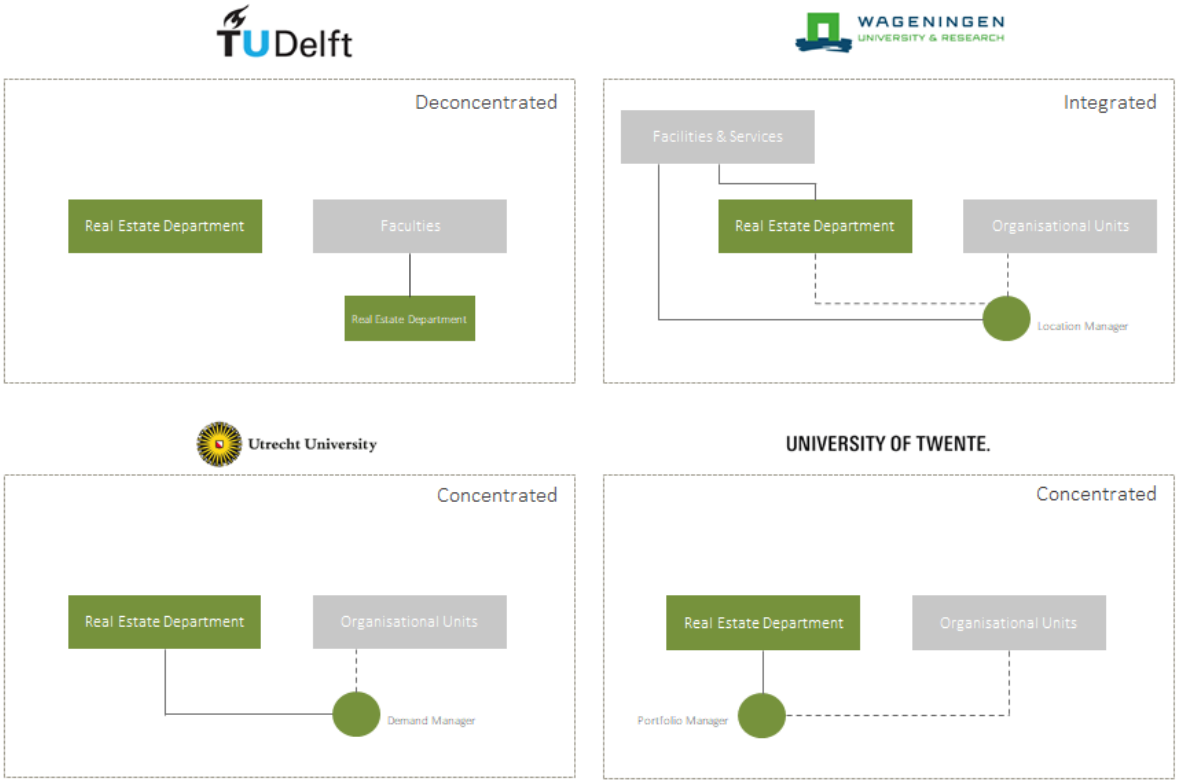


Figure 10.8 – Level of concentration for each of the four universities (own illustration)

Possible explanation for findings

The differences between the development stages of the four real estate department could be attributed to the level of concentration. An advantage of deconcentrating the real estate activities is a better alignment of real estate services and the primary process (Bank & den Heijer, 2004). TU Delft is the only organisation that has deconcentrated its real estate activities. This decision is reflected in the presence of a real estate department at faculty level. The real estate departments at faculty level know exactly what their faculty's demands are, which makes communication and collaboration easier with the central real estate department. This ensures a better alignment of the user demands and the real estate portfolio. WUR has an shared service center that integrates all supporting services of the university, and UU and UT have concentrated their real estate activities in a central real estate department. Although their activities are concentrated, WUR and UU use location manager and demand managers to ensure a good alignment between the real estate portfolio and the user demands. The location and demand managers are delegated from either the shared service center or the central real estate department, which means that their primary focus not only includes the faculties' real estate. The location managers of WUR are responsible for all supporting services, and thus also have to consider other the supporting services. UT does not use location or demand managers that are located at the faculties. The real estate department of UT has a portfolio manager that communicates with the faculties, in addition to his other activities. This causes difficulties in aligning the real estate portfolio with user demands.

10.2.3 FINANCIAL PERSPECTIVE

Figure 10.9 shows the strategic perspective of the real estate management processes of the four Dutch universities. The figure illustrates that the real estate departments of WUR and UU can be positioned at the fourth stage of Joroff et al.

(1993): the Intrapreneur. The real estate department of TU Delft can be positioned at the Business Strategist stage; and the University of Twente at the Dealmaker stage. Table 10.4 summarises the results of the case studies.

Figure 10.9 – Financial perspective of the real estate management processes of the four Dutch universities (own illustration)

TU Delft, UU and UT have financial controllers on different levels in their organisation. TU Delft has a central financial department, and the real estate department has its own financial department. UU has a central financial department, a financial department that is part of the C&FM department, and a financial department that is part of the real estate department. UT has a central real estate department and a financial administrator that works for the real estate department. The financial controllers at the different levels work closely together on the real estate finances. WUR only has a central financial department.

WUR, UU and UT use an internal costing system for their real estate; the faculties or organisational units have to pay for their housing. TU Delft does not charge it faculties rent for their housing. The real estate department of TU Delft does discuss the real estate costs and the efficiency of space use with the users, and reports this to the Executive Board.

	Financial controllers and financials tools and systems
Delft University of Technology	* the real estate department does not use an internal costing system. The real estate department does discuss the real estate costs and the efficiency of space use with the users, and reports this to the Executive Board. This way, the faculties and the real estate organisation are both aware of the actual space use and how to improve the efficiency. * financial controllers are present on multiple levels in the organisation. The real estate department has its own financial department that sets up financial reports, and matches these reports to the institutional reports. The central financial compiles long-term financial plans twice a year. The plans are frequently revised and adjusted to the changing context. The central financial department works closely with the financial department of the real estate department.
Wageningen University & Research	* the real estate department does not have its own financial department. The central Finance department is responsible of the financial resources of the whole university, including real estate. * The real estate department considers focuses on matching WUR's real estate to the primary process, but at the lowest costs possible. * The real estate department uses several financial tools and systems, such as the financial real estate budget and an internal costing of real estate system. The real estate department creates long-term financial plans. This shows that the department is aware of the risks and costs of its real estate.
Utrecht University	* financial controllers are present on multiple levels in the organisation. The university has a central Finance, Control & Administration department that advises the Executive Board, the faculties and the supporting services on financial matters. The real estate department has its own financial department that is responsible for the planning and control cycles, and efficient administrative management and a consistent administrative organisation * with the reorganisation, the financial department of CRE&C has gained an independent and autonomous position within the real estate department * the real estate department is currently in a transition from being cost-driven to becoming more value-driven * the real estate department analyses the costs, benefits and risks of its real estate on a yearly basis. * the real estate department uses an internal costing system.
University of Twente	* financial controllers are present on multiple levels in the organisation. The financial administrator of the real estate department and the financial controller of the financial department of C&FM are responsible for the real estate finances. The central Finance department is responsible for the financial resources of the whole university, including real estate. There is a good link between these two levels. * real estate department closely monitors its real estate finances. The real estate department evaluates its housing initiatives within the financial frameworks of the university, formulates a long-term financial outlook, and formulates financial risks * the real estate department uses an internal costing system: the users pay a competitive rate for their real estate. The real estate department is very transparent towards the users on how these prices are made up. Due to this system, the users are well aware of the costs of their real estate and use it more efficiently.

Table 10.4 – Summary analysis case studies – financial perspective (own table)

Possible explanation for findings

A possible explanation for the differences in development stage is the difference in focus of the real estate departments. The real estate department of UU is becoming more value-driven, rather than cost-driven; and the department focuses on broader added values of real estate than only costs. The real estate department of WUR, however, is still very cost-driven, and focuses on providing real estate services at the lowest costs possible:

> *"(…) our ambition is to [offer real estate services] as optimally as possible in terms of quality (…). We want to offer this quality, and we want to do that at the lowest possible costs. (…). Our drive is still quite cost-driven, but also quality-driven and sustainability-driven (…). But all with the aim of [providing the real estate services] at the lowest possible costs" (WUR, personal communication, March 22, 2019).*

The differences between the development stages of the four real estate department could be attributed to the location of the financial controllers. A disadvantage of only having centrally located financial controllers, rather than having financial controllers on multiple levels in the organisation, is that a distance is created between the financial controllers and the real estate department. Centrally located financial controller focus on the financial resources of the whole university. The financial controllers at real estate department level can focus entirely on the real estate finances. Having a financial department at real estate department level seems to benefit the financial perspective.

10.2.4 PHYSICAL PERSPECTIVE

Figure 10.10 shows the strategic perspective of the real estate management processes of the four Dutch universities. The figure shows that the real estate departments of TU Delft, WUR and UU can be positioned at the fifth stage of Joroff et al. (1993): the Business Strategist. The real estate department of UT can be positioned at the Intrapreneur stage. Table 10.5 summarises the results of the case studies.

Figure 10.10 – Physical perspective of the real estate management processes of the four Dutch universities (own illustration)

As described in Table 10.5, all four real estate departments regularly measure and assess the physical condition of their real estate portfolios. The assessments serve as input for their long-term maintenance plans. The maintenance plans are frequently revised and adjusted.

All four universities have a strong focus on sustainable development. This focus is made explicit in several plans that are currently being implemented. The real estate departments also monitor the energy performance of their real estate portfolio. TU Delft and UT publish the data on energy performance in an online energy monitor.

Possible explanation for findings

UT is the only university that is at a different development stage. The difference in development stage could be ascribe to the separation of the strategical and operational level of the real estate management process. When separating the two levels, the knowledge and expertise on both levels are also separated, and it becomes more difficult to align operational tasks with strategical policy (Bank & den Heijer, 2004). This possible explanation is supported by the findings of the case study analysis of UT. The strategical level and operational level have been separated until the reorganisation in 2017. Before 2017, the real estate department only focused on maintaining its current real estate portfolio (operational), and an individual real estate organisation – Real Estate Group Drienerlo – focused on new construction projects (strategical and tactical). The real estate department has been recently reorganised, and is still adjusting to the new situation. The department is aware that the alignment could be better:

> *"(…) we need to align [the maintenance plans and real estate plans] better. (…). It is not like we do not align the plans at all , but it could be better." (UT, personal communication, May 1, 2019).*

In terms of sustainable development, all four universities have a strong focus on sustainability. All four real estate departments have set sustainability related objectives for their future campus, and have drawn up several sustainability plans in the past decade. Sustainability has become an indisputable, crucial aspect of real estate in the past decade, and has been imbedded in all university plans; this possibly explains why all four real estate department have such a strong focus on sustainability and have designed several sustainability plans.

	Maintenance	Sustainability
Delft University of Technology	* the real estate department regularly assesses the physical condition of its properties. * the real estate department creates long-term maintenance plans. * In 2017, the maintenance strategy has been revised to better align it with the real estate strategy; the renewed maintenance plan differentiates in the level of maintenance for the different types of buildings. This shows that the real estate department frequently revises and adjusts its plans to match the changing demands.	* the real estate department monitors the energy performance of the real estate portfolio * the real estate department has formulated objectives related to sustainable development, such as having no more gas-fired heating in campus by 2040 and having a fully energy neutral campus by 2040. These ambitions are made explicit in plans and are currently being implemented. * the real estate department proposes sustainable and innovative solutions that are in line with its sustainability ambitions * the real estate department invests in buildings in such a way that they are adaptable to future developments in education and research.
Wageningen University & Research	* the real estate department has maintenance plans for all its properties. The plans are based on a depreciation period of 60 years, and includes major renovation projects at year 15, 30 and 45. The maintenance plan thus have a long-term planning. * the real estate department measures the physical condition of its properties on a regular basis.	* the university has high ambitions regarding sustainability, and scores high in different sustainability rankings in the world. The real estate department matches its sustainability plans to the ambitions of the university. * the real estate department continuously created sustainability plans in the last decade. These plans all have a long-term vision and focus on different aspects of the real estate portfolio. The presence of these different plans indicate that the real estate department *generates future strategic plans for continuous improvement*, and that the department *anticipates on trends* and that the department *frequently revises and adjusts its real estate plans to match the changing demands*. * the real estate department monitors the energy performance of all real estate properties
Utrecht University	* physical condition of real estate portfolio is assessed in 2017. The assessment is used as input for the strategic real estate plans and long-term maintenance plans. The maintenance plans are regularly revised and updated. * with the reorganisation, the real estate department transferred its maintenance tasks to the Facility Management department.	* the real estate department has set up several sustainability plans. In these plans, the university and the real estate department express their ambitions for sustainable development of their real estate, and analyse and assess the physical aspects of their real estate portfolio. The presence of these different plans indicate that the real estate department *generates future strategic plans for continuous improvement*, and that the department *anticipates on trends* and that the department *frequently revises and adjusts its real estate plans to match the changing demands*.
University of Twente	* the real estate department assesses the physical condition of its properties every three years. * the real estate department creates long-term maintenance plans. * maintenance is alignment with construction and renovation projects, but could be better.	* the university signed the Long-term Covenant Agreement on Energy Efficiency to cut energy consumption by 30% up until 2020. * the real estate department has created several sustainability plans, such as the Energy Efficiency Plan. The EEP is revised and adjusted every four years. * the real estate department monitors the energy performance of all real estate properties

Table 10.5 – Summary analysis case studies – physical perspective (own table)

10.3 CONCLUSIONS

The cross-case analysis performed in this chapter uses the analytical framework discussed in Chapter 4 for combining and comparing the case studies. The chapter elaborates on both dimensions of the analytical framework: (1) organisational structure, and (2) University Real Estate Management. The findings from the cross-case analysis are summarised in the conclusion discussed below, and complemented by the findings of the literature study. For each structural choice it is discussed if and how it impacts university real estate management. Table 10.6 summarises the conclusion discussed below.

It should be noted that the results discussed below are found in a specific context, which was unique for each of the four studied cases. In addition to this, the analytical framework does not always gives a fair representation of reality. In practice, the organisational structure of an organisation is much more complex, and is determined by structural choices other than the five that are included in the framework, as well as by other organisational aspects. Also, in practice, university real estate management is a much more complex process, and is influenced by many different factors. Therefore, the findings discussed below are not applicable to all university organisations.

Grouping of departments

Following from both the case studies and the cross-case analysis, no indications were found that the grouping of departments influences the university real estate management process.

Level of centralisation

The level of centralisation influences the *strategic*, *functional* and *financial* management of real estate. In a centralised model, the focus is on institutional goals and objectives rather than faculties goals and objectives. Thus, a centralised model supports the alignment of real estate with institutional goals (+ strategic). However, a centralised model creates a certain distance between the real estate department and the faculties, which causes users to have little influence on their housing, and thereby does not promote efficient use of space. A centralised model therefore does not optimally support the alignment between real estate and the primary process (- functional). Not promoting efficient use of space will therefore not promote costs reduction by pursuing efficient m^2 use. A centralised model thus does not optimally support the alignment between real estate financial value, risks and costs and the production of real estate products and services (- financial).

In contrast, a decentralised model does the exact opposite. In a decentralised model, the focus is on faculties goals and objectives, which makes it easier to align real estate with the primary process – education and research (+ functional). A decentralised model therefore also promotes efficient use of space and cost awareness among the faculties, which makes cost reduction possible (+ financial). At the same time, a decentralised model creates a distance between the real estate department and the senior management, and thereby makes it more difficult to match real estate goals and objectives with institutional goals and objectives (- strategic).

Level of concentration

The level of concentration influences the *strategic*, *functional* and *financial* management of real estate. In a concentrated model, a great emphasis is placed on the efficiency of real estate management activities. Therefore, the activities are therefore concentrated in one place in the organisation. The concentrated execution makes it easier to match the real estate activities with institutional goals and objectives. Thus, a concentrated model supports the alignment of real estate with institutional goals (+ strategic). However, a concentrated model causes users to have little influence on their housing, which makes it more difficult to align real estate with the primary process (- functional). With a concentrated execution of real estate activities, economies of scale can be achieved through the acquisition of products and services, and by coordinating the use of facilities, services and spaces. Thus, a concentrated model supports the alignment between real estate financial value, risks and costs and the production of real estate products and services (+ financial).

In a deconcentrated model, the execution of the real estate activities are located closer to the faculties, which makes it easier to match the real estate activities with faculties goals and objectives, user demands and user satisfaction (+ functional). However, the deconcentrated execution of real estate activities also makes it more difficult to align the activities with institutional objectives and goals, nor with the corporate identity of the university (- strategic). The deconcentrated execution of the real estate activities also makes it more difficult to achieve economies of scale (- financial).

An integrated model has a similar impact on real estate management as a concentrated model. With the concentrated execution of real estate activities and the integration of all supporting services, economies of scale can be achieved through the acquisition of products and services, and by coordinating the use of facilities, services and spaces (+ financial). Having all supporting services in a central place in the organisation, also makes it easier to match the services with the institutional goals and objectives (+ strategic). An integrated model also promotes the provision of uniform services and uninterrupted facilities, and thereby results in the provision of improved services to customers and users (+ functional). At the same time, integrating all supporting services into one organisational unit creates a certain distance between the real estate department and the faculties. Therefore, the alignment between real estate and the primary process becomes more difficult (- functional). Thus, for an integrated model to positively influence the functional management of real estate, it is crucial to well maintain the relation between the real estate department and the faculties.

An example of this was seen in the case of WUR; the central service center – Facilities & Services – uses location managers that are located at each organisational unit, but still work for the Facilities & Services department.

Level of sourcing

The level of sourcing influences the *strategic, financial* and *physical* management of real estate. The main reason for outsourcing real estate activities is cost reduction; as outsourcing creates possibilities for economical savings, and external service providers can execute the activities more cost efficient. Therefore, outsourcing real estate activities supports the alignment between real estate financial value, risks and costs and the production of real estate products and services (+ financial). However, outsourcing real estate activities can also make it more difficult to align real estate activities with institutional goals and objectives, as external parties may not be fully aware of institutional goals and objectives (- strategic). Outsourcing real estate activities could also separate the strategic and operational level of real estate management, as operational tasks are mostly outsourced. Outsourcing operational tasks makes it more difficult to align operational real estate activities with strategic and tactical real estate activities (- physical / - strategic). This is especially the case for the *coordinating model* and the *demand model*, as these two models outsource the operational level of real estate management completely.

Having knowledge and experience in the field of university real estate management in-house is one of the main reasons to keep real estate activities in-house. Keeping real estate activities in-house makes it easier to match the activities to institutional goals and objectives, as well as keeping an overview and having control over all activities (+ strategic). Keeping all or almost all real estate activities in-house also makes it easier to align all levels of real estate management (+ physical / + strategic).

Position real estate department

The position of the real estate department influences the *strategic*, *functional* and *financial* management of real estate. Being close to the Executive Board has as advantage that the real estate department is well aware of the institutional objectives and goals, and can align the real estate plans accordingly (+ strategic). However, a high position also causes the real estate department to be less well aware of the faculties objectives and goals. A high position also creates a certain distance between the real estate department and the faculties, which causes users to have little influence on their housing, and thereby does not promote efficient use of space. All this makes it more difficult to align real estate with the primary process (- functional). Not promoting efficient use of space will therefore not promote costs reduction by pursuing efficient m^2 use. A centralised model thus does not optimally support the alignment between real estate financial value, risks and costs and the production of real estate products and services (- financial).

Being close to the faculties has as advantage that the real estate department is well aware of faculties objectives and goals, user demands and user satisfaction. Having a low position also makes it possible for the real estate department to work result-oriented and quickly reply to real estate issues from the faculties (+ functional). A low position also promotes efficient use of space and cost awareness among the faculties, which makes cost reduction possible (+ financial). However, being close to the faculties instead of to the Executive Board makes it more difficult to align real estate with institutional goals and objectives (- strategic).

Separating or joining the strategic and operational level

The separating or joining of the strategic and operational level influences the *strategic, financial* and *physical* management of real estate. Joining the strategic and operational level has as advantage that the real estate department has knowledge and expertise on both levels, which makes it easier to align operational matters with strategic policy (+ strategic / + physical). Also, the joining of both levels supports the university's corporate identity (+ strategic). Aligning operational matters with strategic policy creates opportunities for cost savings (+ financial).

Separating the strategic and operational level means that the knowledge and expertise on both levels are also separated, and it becomes more difficult to align operational tasks with strategic policy (- strategic / - physical). Not aligning operational tasks with strategic policy is also not very cost efficient. Therefore, separating the strategic and operational level does not optimally support the alignment between real estate financial value, risks and costs and the production of real estate products and services (- financial).

		Added value of RE	University Real Estate Management			
			Strategical	Functional	Financial	Physical
Level of centralisation	Centralised	* alignment between real estate and institutional goals and objectives	+	-	-	
	Decentralised	* alignment between real estate and primary process * reducing costs by efficient use of space	-	+	+	
Level of concentration	Concentrated	* economies of scale * strengthening the corporate identity of the university	+	-	+	
	Deconcentrated	* alignment between real estate and primary process	-	+	-	
	Integrated	* economies of scale * provision of uniform services and uninterrupted facilities * provision of improves services to customers and users	+	-/+	+	
Level of sourcing	Administrative	* keeping an overview and control over all activities * alignment between strategic, tactical and operational levels of university real estate management	+		-	+
	Coordinating	* cost reduction through economical savings and cost efficient external service providers	-		+	-
	Demand	* cost reduction through economical savings and cost efficient external service providers	-		+	-
Position real estate department	Close to the Executive Board	* alignment between real estate and institutional goals and objectives	+	-	-	
	Close to the faculties	* alignment between real estate and primary process * reducing costs by efficient use of space *	-	+	+	
Separating / Joining strategic and operational level	Separated	-	-		-	-
	Joined	* alignment between operational tasks and strategic policy * cost efficient * strengthening the corporate identity of the university	+		+	+

Table 10.6 – Summary of all findings (own table)

PART 3
TOOLBOX & CONCLUSIONS

LIBRARY, UTRECHT UNIVERSITY
PHOTO: UU

CHAPTER 11 – TOOLBOX

The thesis began with the observation that university real estate departments seek to attain the organisational structure that supporting their real estate management activities, achieving their organisational objectives and adding value to their organisational performance. However, it was also mentioned that there is no "optimal" organisational structure, as there is no one right solution to this. The question of which structure optimally supports the university real estate management process should rather be which organisational structure is preferred based on certain conditions and priorities. To decide which organisational structure is preferred, it is necessary to fully understand the relation between organisational structure and university real estate management; which is the main focus of this research. Existing CREM and organisational management theories were examined and combined and made applicable to the university real estate sector, resulting in the design of a toolbox that can contribute to the university real estate sector. The toolbox enables university real estate departments to assess their organisation on both its structure and management process, and is intended to provide a reference for the relation between organisational structure and real estate management.

Table 11.1 lists the tools for assessing the relation between organisational structure and university real estate management with a brief description of what the tool is for. The table also refers to the related sections in this chapter.

		Purpose
11.1	**Analytical Framework –** Organisational Structure	determining the organisational structure of the university and its real estate organisation
11.2	**Analytical Framework –** UREM	assessing the university real estate management process
11.3	Assessment model	determining which organisational structure is preferred based on specific conditions and in a specific context

Table 11.1 – A toolbox to support university real estate management

The toolbox is based on the design of the analytical framework. The first tool (11.1) consists of the first dimension of the analytical framework: organisational structure. The tool provides an overview of several structural choices that an university can make with regard to its organisational structure. The tool can be used to determine the organisational structure of the university and its real estate department. The result of this analysis is the formulation of four structural choices. The second tool (11.2) consists of the second dimension of the analytical framework: university real estate management. The tool is used to determine the development stage of the university real estate organisation from each of the four Corporate Real Estate Management perspectives. The third and last tool (11.3) determines which organisational structure is preferred based on the pursued added values and using all argument, both in favour of and against the different structural choices. The toolbox presented in this chapter is a first attempt at combining different information and tools to assess the relation between organisational structure and university real estate management.

11.1 ANALYTICAL FRAMEWORK – ORGANISATIONAL STRUCTURE

The analytical framework first (1) determines the role of real estate within the organisation	
Purpose	determining the organisational structure of the university and its real estate organisation
How	analysis of the organisational structure of the university and its real estate department
Result	formulation of four structural choices

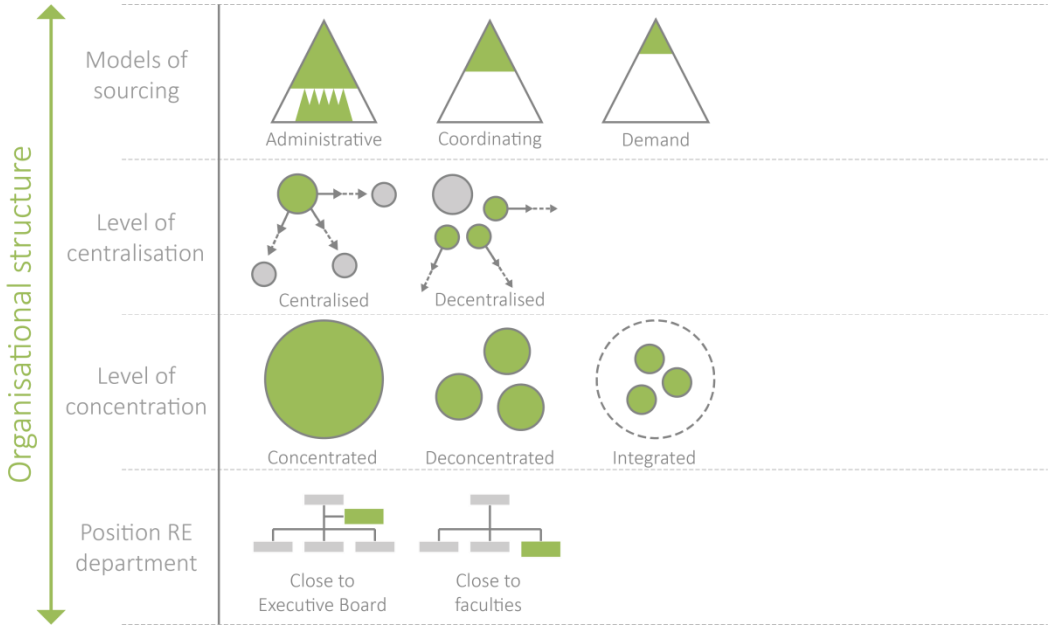


Figure 11.1 – Analytical Framework: Organisational Structure – tool for determining the organisational structure of the university and its real estate organisation (own ill.)

Determining how the organisation supports the university real estate management process and which organisational structure is preferred starts with an analysis of the current organisational of the university organisation. The analysis of the organisational structure will determine the role of real estate management within the organisation. The analysis consists of three parts: (1) an analysis of the organisational structure of the university, (2) an analysis of the organisational structure of the university real estate organisation, and (3) four structural choices: the level of sourcing, the level of centralisation, the level of concentration, and the position of the real estate department within the university. The four structural choices are the key part of this tool, and are presented in the analytical framework (Figure 11.1). The tool presented here differs from the analytical framework presented in Chapter 4. In this tool, the grouping of department has been left out, as this has no impact on the university real estate management process.

The analytical framework is based on the *Analysis Framework* of Matser (2018). Matser's Analysis Framework has been altered to make it applicable to university real estate organisations. The alteration is based on literature research; the most important one being the study of Bank & den Heijer (2004), which studied several choices and considerations regarding the structure of the university real estate organisation. An addition to Matser's model includes the item 'position RE department'. The position of the real estate department determines whether the real estate department is closer to the Executive Board or to the faculties. The structural choice indicates the amount of decision-making authority that the real estate department has, and whether it needs approval for decisions from higher levels of authority in the organisation. Other alterations include leaving out several items that were not relevant for the university real estate sector.

The tool describes the organisational structure of the university and its real estate department. The result of the analysis of the organisation structure is the formulation of four structural choices. These structural choices determine whether real estate activities are outsourced or kept in-house, whether real estate decision-making is centralised or decentralised, whether real estate activities are concentrated, deconcentrated or integrated, and whether the real estate department has a high or a low position within the university. This is not only important for decisions regarding the real estate organisation, but also for the entire university organisation. Changing the organisational structure can impact the whole internal context of the university, including the real estate management process. The university real estate management process is further elaborated in the second tool of the analytical framework (11.2). How the organisational structure impacts the university real estate management process is further elaborated in the assessment model (11.3).

11.2 ANALYTICAL FRAMEWORK – UNIVERSITY REAL ESTATE MANAGEMENT

The analytical framework secondly (2) assesses the integration of the different stakeholder perspectives in the university real estate management process	
Purpose	assessing the university real estate management process
How	determining the development stage of the real estate department from each of the four stakeholder perspectives by using the five-stage development model of Joroff et al. (1993) – *task manager*, *controller*, *dealmaker*, *intrapreneur*, and *business strategist* – and the four perspectives of Corporate Real Estate Management determined by den Heijer (2011) – *strategic*, *functional*, *financial* and *physical*
Result	formulation of the development stage of the real estate department from each of the four CREM perspectives

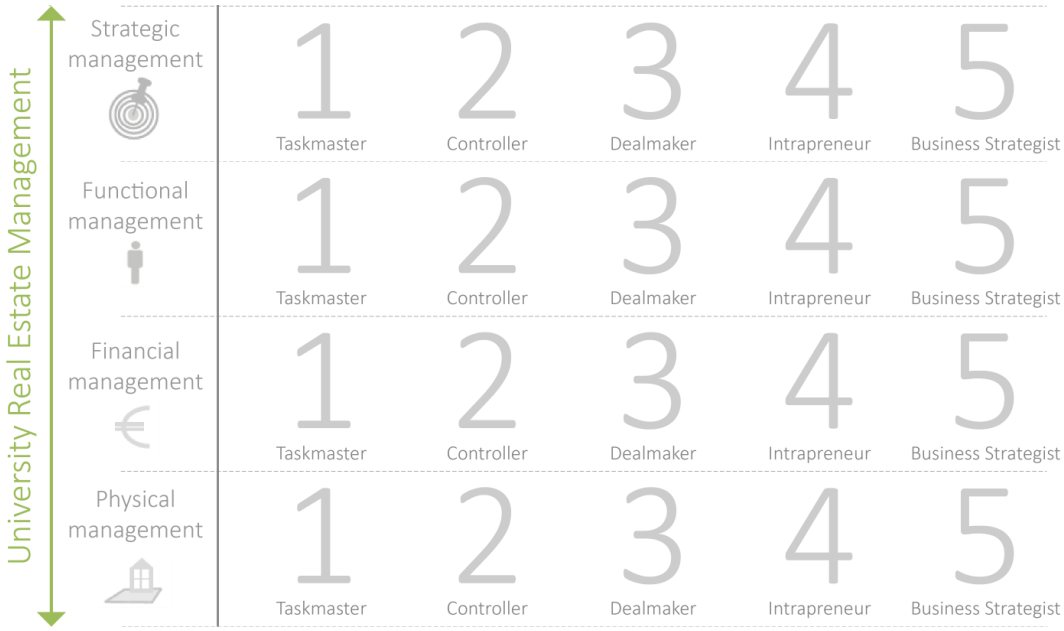


Figure 11.2 – Analytical Framework: University Real Estate Management – tool for assessing the university real estate management process (own ill.)

Determining how the organisational structure of the university and its real estate organisation impacts the university real estate management process starts with an assessment of the current real estate management process. The assessment of the university real estate management process will determine how well the four CREM perspectives are integrated in the real estate management process. The assessment model combines the five-stage development model of Joroff et al. (1993) and the four perspectives of CREM determined by den Heijer (2011). The assessment model is presented in the analytical framework (Figure 11.2).

The tool is used to determine the development stage of the university real estate organisation from each of the four CREM perspectives. The five development stages of Joroff et al (1993) are: task manager, controller, dealmaker, intrapreneur, and business strategist. As defined in the analytical framework (see section 4.2), the added values for each of the four CREM perspectives are defined as follows:

- Strategic: aligning real estate with institutional goals
- Functional: aligning real estate with primary process
- Financial: aligning real estate financial value, risks and costs with production of products and services
- Physical: aligning quantity and quality of current and future real estate with the accommodation demand

For each CREM perspective, assessment criteria are described to measure which stage of development fits the real estate department. Table 11.2 presents the assessment model. It should be noted that although the analytical framework uses numeric stages – 1 to 5 – these numbers do not represent the results nor the performance of the university real estate management, but rather the intention of the university real estate management process. Therefore, there are no right or wrong stages; the stage of development is just a tool to determine whether the real estate department's behaviour and focus meets the university's current needs.

The assessment model is based on previous research. The model uses the theory of den Heijer (2011) and Joroff et al. (1993) as a starting point. In addition to the literature, the assessment model is based on two previously established model by Wu (2015) and van der Zwart (2014). Wu (2015) proposes a model to measure the maturity level of the university real

estate department. The model also links the four stakeholder perspectives to the five stages of development by Joroff et al. (1993). Van der Zwart (2014) proposes a similar model to assess the real estate perspectives. The model also combines the four stakeholder perspectives with the five stages of development by Joroff et al. (1993). Both models are individually not sufficient for assessing the development stage of the university real estate department from each of the four CREM perspectives. The assessment model therefore combines the assessment criteria used in both models, as well as the research of den Heijer (2011) and Joroff et al. (1993).

	Strategic	Functional	Financial	Physical
	aligning real estate with institutional goals	aligning real estate with (primary) processes	aligning real estate financial value, risks and costs with production of products and services	maintaining quantity and quality of current and future real estate
Task manager	* supply in university's demand for real estate * senior management is involved with real estate department	* supply in faculties' demand for real estate * real estate enables students and researchers to produce knowledge	* supply in demand for real estate within budgets * real estate is viewed as neither a cost nor benefit	* supply in demand for real estate * provide general service on real estate as needed * corrective maintenance
Controller	* real estate department reports results to the senior management * presence of statements related to strategic goals, but not made explicit in plans	* physical environment optimal for primary process * analyses of primary processes * interaction and dialogue with faculties about their short- and long-term needs	* supply in demand for real estate at the lowest cost possible * awareness of potential costs and benefits of real estate * control and minimize real estate costs * analytical focus	* awareness of technical building costs * reducing square meters * presence of statements related to sustainability goals, but not made explicit in plans
Dealmaker	* strategic focus is made explicit in plans * real estate department communicates regularly with senior management * real estate department behaves proactively and comes up with new ideas	* physical environment optimal for faculties * analyses of user satisfaction * real estate department works together with faculties to identify the optimal space needs * standardisation real estate usage	* presence of financial tools and systems * balancing real estate costs against increasing costs of primary process * internal costing of real estate costs * analysing and documenting sources of market value	* basic inventory routines on real estate * focus on sustainability is made explicit in plans * analysis of physical aspects real estate portfolio * presence of maintenance plans * preventive maintenance
Intrapreneur	* full implementation or ongoing execution of strategic plans * long-term strategic planning * real estate department works closely together with senior management * matching the real estate department's strategy to its competitors' * real estate department coordinates plans with other support services	* overview of space use * overview of occupancy rates and frequency rates of real estate * real estate department works closely together with faculties and is involved in faculties' strategic planning processes * proposing real estate data and alternatives to faculties	* balancing real estate costs against optimising and increasing productivity * proving importance real estate through measurable results * real estate department acts as profit center * presence of financial controllers within the real estate department * long-term financial planning * scenario and risk planning	* full implementation or ongoing execution of sustainability plans * full implementation or ongoing execution of maintenance plans * proposing innovative and sustainable solutions * overview of real estate's energy performance * long-term maintenance planning
Business strategist	* generating future strategic plans for continuous improvement * high frequency of revising and adjusting real estate plans to match the changing demands * anticipating on trends, measuring and monitoring their impacts and contributing to the direction of the university as a whole * real estate department is closely aligned with senior management * real estate adds value to institutional goals and thereby improves the competitive advantage	* generating future plans to improve space use and thereby maximise efficiency * a state of the art learning and working environment * real estate department and faculties begin to regularly integrate space requirements and the real estate strategy into their joint initiatives * real estate adds value to the primary process and thereby improves the productivity * anticipating on trends, measuring and monitoring their impacts	* high frequency of revising and adjusting financial plans to match the strategic plans and changing demands * willingness to invest a larger amount of money in projects which create added value on the long-term *(balance between financial value, risks &costs and added value)* * real estate adds value to financial goals and thereby improves the profitability * real estate department is closely aligned with CFO * anticipating on trends, measuring and monitoring their impacts	* generating future sustainability plans for continuous improvement * willingness to keep outdated buildings which create added value in other aspects *(balance between physical condition and added value)* * real estate adds value to sustainability goals and thereby improves the sustainable development * anticipating on trends, measuring and monitoring their impacts

Table 11.3 – Assessment of development stage from real estate perspectives (based on den Heijer, 2011; Joroff et al., 1993; van der Zwart, 2014; Wu, 2015)

11.3 ASSESSMENT MODEL

The assessment model determines the preferred organisational structure based on specific conditions and priorities	
Purpose	determining which organisational structure is preferred based on specific conditions and priorities
How	determining the preferred organisational structure by taking several steps. These steps are: (1) determining which added values of RE are pursued (2) considering all arguments, both in favour of and against a particular structural choice (3) determining which organisational structure is preferred
Result	formulation of a preferred organisational structure

		Added value of RE	University Real Estate Management			
			Strategical	Functional	Financial	Physical
Level of centralisation	Centralised	* alignment between real estate and institutional goals and objectives	+	-	-	
	Decentralised	* alignment between real estate and primary process * reducing costs by efficient use of space	-	+	+	
Level of concentration	Concentrated	* economies of scale * strengthening the corporate identity of the university	+	-	+	
	Deconcentrated	* alignment between real estate and primary process	-	+	-	
	Integrated	* economies of scale * provision of uniform services and uninterrupted facilities * provision of improves services to customers and users	+	-/+	+	
Level of sourcing	Administrative	* keeping an overview and control over all activities * alignment between strategic, tactical and operational levels of university real estate management	+		-	+
	Coordinating	* cost reduction through economical savings and cost efficient external service providers	-		+	-
	Demand	* cost reduction through economical savings and cost efficient external service providers	-		+	-
Position real estate department	Close to the Executive Board	* alignment between real estate and institutional goals and objectives	+	-	-	
	Close to the faculties	* alignment between real estate and primary process * reducing costs by efficient use of space *	-	+	+	
Separating / Joining strategic and operational level	Separated	-	-		-	-
	Joined	* alignment between operational tasks and strategic policy * cost efficient * strengthening the corporate identity of the university	+		+	+

Figure 11.3 – Assessment model for determining the preferred organisational structure (own ill.)

In addition to determining the current organisational structure and assessing the university real estate management process, determining which organisational structure is preferred also requires an assessment which determines the organisation's specific conditions and priorities. After the organisation's conditions and priorities are determined, all arguments in favour of and against the structural choices should be considered. Once the pursued added values are determined and all arguments are considered, a decision can be made regarding the organisational structure. This tool is based on the literature study and the results of the cross-case analysis. The assessment model is presented in Figure 11.3.

As mentioned before, the toolbox does not provide one "right" solution, nor an "optimal" solution. The toolbox provides a preferred solution based on the university organisation's priorities and conditions. These conditions and priorities may speak in favour of a specific structural choices, but can also be against certain structural choices. However, these conditions and priorities are highly subject to contextual changes, and therefore may change over time; which means there is no right or wrong solution to organisational structure. Therefore, before deciding on an organisational structure, it is important for a university organisation to consider all arguments, both in favour of and against the organisational structure.

To determine which organisational structure is preferred, the following steps need to be followed:

(1) determining which added values of RE are pursued

(2) considering all arguments, both in favour of and against a particular structural choice

(3) determining which organisational structure is preferred

(1) determining which added values of RE are pursued

The consideration between different structural choices depends on the priorities and condition set by the university organisation. One of the most important priorities are the added values that the organisation wants to achieve. Determining which added values of real estate are pursued is of crucial important, as the different elements of added value can be supported by the design of the real estate organisation.

Based on the findings of the literature study, the case studies and cross-case analysis, the following added values of real estate were found:

- reducing costs by pursuing efficient m^2 use
- strengthening the 'corporate identity' of the university
- utilizing economies of scale with the acquisition of products and services, and by coordinating the use of facilities, services and spaces
- having knowledge of the primary process and objectives and goals of the university
- having in-house knowledge and skills in the field of University Real Estate Management
- provision of uniform services and uninterrupted facilities
- cost reduction through economical savings and cost efficient external service providers
- alignment between operational tasks and strategic policy

(2) considering all arguments, both in favour of and against a particular structural choice

As said before, the different elements of added value can be supported by the design of the real estate organisation. How well the organisation supports the added value depends on the different structural choices that make an organisation. The pursued added values can speak in favour of a certain structural choices, but can also be against certain structural choices. For example, if reducing costs by pursuing efficient m^2 use is an important goal, then a decentralised model would be a better fit than a centralised model.

There are also situations in which certain structural choices should be avoided. An example of a structural choice that should be avoided found in this research, is separating the strategic and operational level of real estate management. Both in literature as well as in the case studies, this structural choice emerges as one that should be avoided. Based on literature, separating the strategic and operational level leads to a lack of overview and control of all levels of real estate management, and also a lack of expertise and knowledge on both levels in one central place. The literature is supported by the findings of the case study analysis of University of Twente. When creating its internal real estate department, UT choose to divide the two levels of real estate management by creating two separate real estate organisations: an internal real estate department and an individual real estate organisation – Real Estate Group Drienerlo. The real estate department only focused on maintaining its current real estate portfolio (operational), and the Real Estate Group Drienerlo focused on new construction projects (strategical and tactical). The result of this structural choice was that it became

difficult to align operational tasks with strategical policy. This structural choice has directly impacted the strategic and physical management of real estate, and the financial management indirectly.

All arguments, both in favour of and against the different structural choices, are discussed in detail in Chapter 4 of this thesis. For an even more detailed overview of all arguments, the research of Bank & den Heijer (2004) can be studied.

(3) determining which organisational structure is preferred

Once the pursued added values are determined and all arguments are considered, a decision can be made regarding the organisational structure. By using the toolbox presented in Figure 11.3, the university real estate organisation can assess which organisational choice fits their current priorities the best. The toolbox provides an overview of all structural choices, which added values can be achieved with each structural choice, and how each structural choice impacts the real estate management process.

The tool can also be used in a different way. When assessing the university real estate management process, it is possible that the university real estate organisation wants to improve its management process in a certain CREM perspective. For example, when the functional management is at the *Dealmaker* stage and the real estate department wants to improve the alignment between its real estate and its primary processes, and thereby move to the *Intrapreneur* stage. The real estate organisation can then use the toolbox to see which structural choices impact the functional management of the university real estate management process. The organisation can then decide to change its organisational structure.

It should be noted here that the findings in this research were found in a specific context, which was unique to each of the four studied cases. The different structural choices are therefore not applicable to all university organisations. Also, the structural choices are explored in an individual setting, which means that when combining multiple structural choices, the results can be different than displayed in this toolbox.

FORUM, WAGENINGEN UNIVERSITY & RESEARCH
PHOTO: WESSEL VAN GEFFEN ARCHITECTEN

CHAPTER 12 – CONCLUSIONS & DISCUSSION

12.1 CONCLUSIONS

1. *What information about the context of university real estate organisations is relevant for managing university real estate?*

The most important contextual development is the decentralisation of university real estate in 1995. The decentralisation marked the beginning of a new era of university real estate management. After the decentralisation, the Dutch universities became responsible for maintaining the existing university real estate portfolio and investing in new construction projects; a field of knowledge which was yet unexplored for universities. The decentralisation resulted in universities creating their own internal real estate organisation, and becoming more aware of the added value of real estate.

Another relevant developments in the context of university real estate organisations are the aging real estate portfolio and the decreasing financial resources. At the time of the decentralisation there was already a gap between the needed financial resources for all reinvestments and the received resources. In addition to this deficit, a decline in government funding of education and research in the last two decades can be observed. The deficit in financial resources and the decline in government funding could impact the university real estate management process. After the decentralisation, the universities need to evaluate every real estate project and weigh the benefits against the benefits of investing in the primary process. This could help saving costs by promoting efficient use of space. However, it could also endanger the primary process, if the necessary investment are not made and the physical condition affects the organisational performance.

2. *What theories apply to university real estate management and organisational management?*

The theories on Corporate Real Estate Management are most applicable to university real estate management (den Heijer, 2011). Corporate real estate management is the process of matching demand and supply, with activities from operational to strategical level (den Heijer, 2011; den Heijer & de Jonge, 2004). CREM theory is based on the proposition that corporate real estate adds value to organisational performance. Organisational performance can be defined by productivity, profitability, competitive advantage and sustainable development. The role of corporate real estate management has gradually changed over the years, where as in the past real estate was seen as a necessary cost, and nowadays real estate is seen as the fifth resource for organisations. The changing role corporate real estate management is described in five development stages by Joroff et al. (1993). The changing role of corporate real estate management has also caused CREM theory to evolve over the years. CREM theory elaborates on four different stakeholder perspectives: strategical, functional, financial and physical. The CREM model of den Heijer (2011) links the different stakeholder perspectives to organisational performance: strategical - competitive advantage; functional - productivity; financial - profitability; physical – sustainable development.

The theories on organisational design appear to be most relevant for this research. Organisational design theory is concerned with understanding the different aspects of organisations, and the theory is mostly used to create and develop organisations in such a way as to achieve high performance and effectiveness. Organisational design theory is based on the proposition that there must be a match between structural and contextual dimensions. However, the theory also proposes that there is no one best way of organisational design, as organisations are highly influenced by their context, which often is uncertain. Mintzberg (1979) describes the structural dimensions of organisation, such as different organisational configurations and basic parts of every organisation. Five different organisational configurations are described by Mintzberg (1979): the Simple Structure, the Machine Bureaucracy, the Professional Bureaucracy, the Divisionalised form, and the Adhocracy. Each organisational configuration consists of five basic parts according to Mintzberg (1979): the strategic apex, the middle line management, the operating core, the support staff and the technostructure.

3. *What information and tools are currently available to assess the relation between organisational structure and university real estate management?*

The relation between organisational structure and university real estate management is a quite unexplored field of research, which explains why not much specific information and tools are available to assess this relation. Thus, to assess the relation, it is important to first assess the organisational structure and university real estate management separately, and then compare the two assessments to find correlations between the two. The following information and tools were combined to design the analytical framework. The different information and tools are presented in Appendix V.

In the field of CREM, Krumm (1999) is the first to study the impacts of organisational changes on the role and position of the CREM department of multinational firms. Recently, a follow-up study was conducted by Matser (2018), which focused on the development of the CRE department since the turn of the century. Matser (2018) studied four different variables of organisational structure: the position of the CRE department within the overall organisation, the form of the CRE department, the sourcing of CRE activities, and the role of the CRE department. Matser (2018) designed an analysis framework that includes all four variables. The analysis framework serves as tool for analysing the organisational structure of the CRE department.

In the field of university real estate management, Bank and Den Heijer (2004) are the first to study the impacts of organisational structure on the real estate management process. The study discusses six different possibilities for structuring the university real estate department: the level of centralisation, the level of concentration, the position of the real estate department, the adaptation to the real estate portfolio, the joining or separating of strategical and operational level, and the presence of formal management. Each structural possibility has its own advantages and disadvantage, and impacts the organisational performance differently. The six structural possibilities serve as a tool to help real estate departments with structuring their organisation, and to provide insights into the consequences of organisational changes for organisational performance.

Wu (2015) studied how the maturity level of campus management influences the created added value of real estate. Wu combines the four CREM perspectives of den Heijer (2011) with the five levels of maturity. The levels of maturity are based on several other studies, including the five development stages of Joroff et al. (1993). The maturity model uses six different assessment criteria: awareness, goal focus, innovation level, tools and systems, skills and expertise, and communication. For each CREM perspective, the assessment criteria are used to measure the maturity level of campus management. The maturity model serves as a tool to assess the maturity of campus management, and to support decision-making.

In the field of hospital real estate management, van der Zwart (2014) conducted a study on how real estate can contribute to the attainment of the organisational objectives of hospitals. A part of his research included studying the relation between CREM and organisational management. To study this, van der Zwart created a meta-model that assesses the real estate organisation. In this meta-model, van der Zwart combines the four CREM perspectives of den Heijer (2011) with the five development stages of Joroff et al. (1993). The assessment model can be used as tool for assessing the CREM perspectives.

4. *How is the concept of assessing the relation between organisational structure and university real estate management perceived and used by Dutch university real estate departments?*

The case studies have shown that Dutch real estate departments are aware of the impacts of organisational changes on the real estate management process. The real estate department do not only perceive this relation, but also actively respond to it. From the case studies it can be concluded that the real estate department think on a strategical level about their real estate management services and how the organisational structure can better support these services. In the last decade, all four universities reorganised their real estate department with the aim to improve the provision of services to their customers or to have a professional real estate department that solely focuses on the real estate challenges. Improving the provision of real estate services or having a professional real estate department are both ways to achieve added value to organisational performance.

Finally, the results have shown that the Dutch universities are still in a transition process. After the decentralisation of university real estate in 1995, the Dutch universities were confronted with a new challenge, one that all universities were unexperienced in at that time. Several universities took an active role in facing this new challenge, and created an internal real estate organisation and started designing real estate plans early on. Several universities chose to take a passive role, and started making real estate plans once it became necessary.

5. *How can the currently available information and tools be used to assess and improve the relation between organisational structure and university real estate management?*

As the relation between organisational structure and university real estate management is a quite unexplored field of research, this research aimed to create a toolbox consisting of information and tools to support the university real estate sector. The currently available information and tools discussed above are combined to design the toolbox. The purpose of the toolbox is to help university real estate organisations in making decisions about the structuring of their organisation and the management of their real estate. Rather than providing one "right" solution or a "most optimal" solution, the toolbox helps to find a preferred solution based on certain conditions and priorities.

The toolbox consists of three tools: (1) an analytical tool that determines the organisational structure of a university real estate organisation, (2) a model that assesses the university real estate management process, and (3) a model that determines which organisational structure is preferred based on specific conditions and in a specific context. Table 12.1 lists the tools for assessing the relation between organisational structure and university real estate management with a brief description of what the tool is for. The toolbox is further elaborated in Chapter 11.

	Purpose
Analytical Framework – Organisational Structure	determining the organisational structure of the university and its real estate organisation
Analytical Framework – UREM	assessing the university real estate management process
Assessment model	determining which organisational structure is preferred based on specific conditions and in a specific context

Table 12.1 – A toolbox to support university real estate management

How does the organisational structure of the university real estate department influence the way university real estate is managed?

Following the results of the study, it can be observed that different structural configurations do influence the university real estate management process. The organisational structure of the university real estate department can be determined by a set of five structural choices: (1) the grouping of departments, (2) the level of centralisation, (3) the level of concentration, (4) the level of sourcing, and (5) the position of the real estate department. Different structural choices will create different structural configurations.

To find the organisational configuration that supports the real estate management process, university real estate departments need to consider which added values they want to achieve. Adding value to organisational performance is the main focus of corporate real estate management. Added value can be created by:

- aligning real estate with institutional goals *(strategic)*
- aligning real estate with the primary process *(functional)*
- aligning real estate financial value, risks and costs with the production of real estate products and services *(financial)*
- aligning quantity and quality of current and future real estate with the accommodation demand (*physical*)

In this study, the added value of real estate is assessed by linking the four Corporate Real Estate Management perspectives with the five development stages of Joroff et al. (1993). The development stage of the real estate department determines whether the real estate department's behaviour and focus meets the university's current needs, or simply put: it determines how and which added value is created by the real estate management process.

To conclude, the organisational structure of the university real estate department influences the way university real estate is managed, as different structural configurations influence how the real estate adds value to organisational performance.

The study focuses on how organisational structure influences the way university real estate is managed. However, based on the findings, it can be concluded that there is a mutual relationship between organisational structure and university real estate management. Not only does organisational structure influence the university real estate management process, but the university real estate management process also influences the organisational structure. The case studies have shown that the university real estate departments have reorganised their organisation due to a changing demand in real estate services. The aim of the reorganisations was to create added value to organisational performance.

12.2 DISCUSSION

The results of this research are discussed in this section.

Organisational structure

To analyse the different university real estate organisations and their real estate management process, an analytical framework was designed. The analytical framework consists of two components: organisational structure and university real estate management. In this study a set of five structural choices is taken into account when defining the organisational structure of the university real estate department. However, both found in theory and in practice, there are many more structural choices that determine the organisational structure.

In theory, several other structural choices were studied also in the context of the university real estate organisation. However, due to the limited time of the research, a small selection needed to be made to keep it within the scope of the study. During the interviews, it became clear that several structural choices which were found in literature, but not included in the analytical framework, were also relevant. One structural choice seemed so important, that the analytical framework was adapted by adding the 'position of the real estate department'.

Following from the case studies, it became clear that several other structural choices also determine the organisational structure. An relevant structural choice concerned the position of the financial controllers in the organisation. The position of the financial controllers influences the financial management of real estate, and was mentioned several times during the different interviews. However, this structural choice was not included in the analytical framework, nor in the literature. Thus the importance of the position of the financial controllers is now lacking in the results.

'structure that optimally supports the management of university real estate'

Throughout the graduation report, the above sentence has been mentioned several times. However, it was also concluded that there is no "optimal" solution to organisational structure. Both theory and practice agreed that the optimal structure does not exists. The "most optimal" structure will be different for every organisation, as each organisation operates in a different context and has different organisational objectives and goals. Therefore, this study focused not on optimal structures, but on preferred structures based on certain conditions and priorities.

Previous research also showed that it is not easy to determine a positive influence and that it is easier to illustrate a negative influence. This was also experienced during this study. Proving a relation between two concepts – organisational structure and University Real Estate Management – turned out to be a lot more difficult. Nevertheless, the study tried to find relations between the two concepts. The study did not focus on how organisational structure can negatively impact the university real estate management process. Although some examples were found during the case studies, how exactly organisational structure negatively impacts the real estate management process has been unexplored in this study.

Added value of the toolbox

The thesis began with the observation that previous studies mainly focus on how corporate real estate adds value to organisational performance without considering how the organisation adds value to the real estate process. The result of this gap in knowledge, is that real estate organisations focus on matching the corporate real estate management process with their organisational objectives and goals, without assessing whether the organisation optimally supports the real estate management process. The objective of this research was therefore to provide a better understanding of the relationship between organisational structure and university real estate management, and thereby study how the organisation can add value to the real estate management process.

The difference between the alignment models of previous research and the toolbox presented here, is the function of the different models. Like the name suggest, previously established models focus on aligning real estate with the organisation: they provide information and tools on how to get from point A to point B – how real estate (A) adds value to organisational performance (B). The toolbox presented here works differently. The toolbox can be used to assess whether the current organisational structure supports the organisation's current objectives and accommodation demand. Finding information and tools regarding this would not be possible by using previously established models, as these models do not take contextual organisational characteristics into account.

Both the previously established models and the toolbox presented here provide solutions on how to improve the university real estate management process and organisational performance. However, steering on different added values is an easy change to make for an organisation; and changing the organisational structure is a complex process which is not done easily.

Development stages of the real estate department

The development stages of Joroff et al. (1993) are represented in the analytical framework by using numeric stages – 1 to 5. It should be noted that these numbers do not represent the results nor the performance of university real estate management, but rather the intention of the university real estate management process. Therefore, there are no right or

wrong stages; the stage of development is just a tool to determine whether the real estate department's behaviour and focus meets the university's current needs.

As explained by Joroff et al. (1993), each development stage brings the real estate department closer to senior management of the organisation. With each successive level the real estate department gains new skills and expertise, and new sources of added value are introduced. As the real estate department evolves from *Taskmaster* to *Business Strategist*, it needs to consider a larger array of stakeholders, and becomes a more recognised and explicit stakeholder within the organisation. Although it was not discussed in the results of this study, each development stage also adds a little power to the university real estate organisation. As the department becomes a more recognized and explicit stakeholder within the organisation, the real estate department also gets more say in the organisation. As this observation is not fully explored during the case studies, it was not included in the results of the study.

12.3 LIMITATIONS OF THE RESEARCH

Due to the limited research on this research topic, the study used a case study approach. The objective of the research was to produce information and tools that could support university real estate departments in assessing the relationship between organisational structure and the university real estate management process, and thereby making better decisions regarding the structure of their organisation and the management of their real estate. The objective is thus to produce knowledge that is applicable to the whole university real estate sector. Therefore, a multiple-case study approach is used to gather information from the whole sector, rather than one singular university real estate organisation. As such, the used research approach contributes to the external validity of the research.

Achieving external reliability in case study research is difficult, as the context is never exactly the same when conducting case studies. To counter this difficulty, the study took contextual developments into considering. As such, the study contributes to the external reliability of the research.

Considering the difficulty of assessing relationships, there is a risk of the used research method negatively influencing the internal validity of the research. In this study, the development stage of university real estate organisations in an example of this. The development stage can be highly normative and subjective, and this could influence the observations and interpretation of the data.

12.4 RECOMMENDATIONS FOR FURTHER RESEARCH

Based on the discussion and limitations of this research as described in sections 12.2 and 12.3, recommendations for further research can be made. The current body of knowledge concerning the organisational structure of the university real estate organisation is rather limited. New research into this field of knowledge can add value to the current scientific body of knowledge.

Conduct similar research again in a few years

Currently, all university organisations are still in a transition process. After the decentralisation of university real estate in 1995, the Dutch universities were confronted with a new challenge, one that all universities were unexperienced in at that time. The field of university real estate management, or campus management, is still very young and could be explored more. In a few years, it is to be expected that university real estate organisations are more familiar with campus management.

Improving the toolbox

The toolbox presented in this thesis is a first attempt at combining different information and tools to assess the relation between organisational structure and university real estate management. There is a lot of room for improvement on the model. One of the most important things that should be added is **more detail** into how different structural choices impact the different CREM perspectives. Currently, the impact is visualised as a '-' or a '+' – corresponding with either a negative impact or positive impact – which is rather concise.

Another relevant change could be adding information or a tool of the **context** of the university real estate organisation. The context of an organisation is probably the most important indicator for change. Changes in the context can form the starting point for a review of the organisation's strategy and matching accommodation strategy, as well as its organisational structure.

Validating the findings

As mentioned in the limitations, there is a risk of the used research method negatively influencing the internal validity of the research considering the difficulty of assessing relationships. To counter this risk, a follow-up research could use quantitative research methods or by using an expert panel.

Also, given the limited number of studied case, the toolbox and findings need to be further validated by a comparison of a larger number of university organisations. This also holds true for the generalisability to other sectors.

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PHOTO: UT

REFLECTION

The following chapter reflects the whole graduation project, including the final product and the process. I will initiate the reflection with a note on my personal process during the graduation project.

PERSONAL PROCESS

Reflecting on the last year, I realise that I have developed an understanding knowledge in the field of real estate management and organisational theory. Starting the research I was struggling a lot with determining my field of interest. Now finishing the graduation project, I still have troubles finding my field of interest for my future career. Moreover, I have realised I have difficulties in making quick decisions and tend to keep things undefined and in the middle, which also led me to the conclusion that defining the scope of your research is crucial.

The graduation project has had its ups and downs. I have learned I work best under the pressure of a closing deadline, which caused a lot of stress the last year. During the research, I have acquired loads of information and I have had some interesting interviews, and I have gained really interesting insights into the university real estate sector. I thoroughly enjoyed positioning myself in the field of university real estate management.

1. TOPIC OF THE RESEARCH

The following section elaborates on the relationship between the graduation project, the master track Management in the Built Environment and the master programme Architecture, Urbanisms & Building Sciences. The section also elaborates on the relationship between the graduation projects and the wider social, professional and scientific framework, and thereby reflecting upon the scientific relevance of the work.

GRADUATION LABORATORY

The study is part of the real estate management graduation laboratory; more specifically of the chair of Public Real Estate from the Management in the Built Environment department, which is a master track of the MSc Architecture, Urbanism & Building Sciences. The Real Estate Management chair focuses on the challenges of managing public real estate portfolios by building theory on improving decision-making processes and finding new concepts for the built environment. The department of Management in the Built Environment works towards a sustainable built environment where the interests of the end user and other stakeholders are key. Management in the Built Environment focuses on solutions for the development and management of buildings, portfolios and urban areas and the education to the next generation of managers in the built environment

The study involves two fields of research: corporate real estate management theory and organisation theory. The research question is: “How does the organisational structure of the university real estate department influence the way university real estate is managed?” The research aims to contribute to the body of knowledge by exploring a gap in literature, combining the fields of corporate real estate management and organisation theory. The study explores how the organisational structure of the university real estate department influences the university real estate management process.

The study focuses on one of the main activities in corporate real estate management: aligning real estate with organisational objectives and adding value to organisational performance. The research thus reflects the focus of the MBE department, the graduation laboratory of REM and the chair of PRE, as well as combining it with another field of research: organisation theory. The research aims to provide a better understanding of the relationship between organisational structure and university real estate management.

RELEVANCE

The relevance of this study is twofold. Firstly, the university real estate management profession has evolved and professionalised in the last two decades. After the decentralisation of university real estate in 1995, managing university real estate has become more complex, and the financial resources of universities have become limited. Due to this changing context, the question of which organisational structure optimally support the management of university real estate is of high relevance. By gaining knowledge on the organisational structure of university real estate departments and the

influence that the organisational structure has on the university real estate management process, universities could make better decisions regarding their organisational structure and the management of their real estate.

Secondly, there is limited research that that connects the organisational structure of university real estate organisations with the university real estate management process. As a consequence, university real estate organisations lack the information and tools to assess whether their organisation optimally supports the real estate management process. Subsequently, this study aims to contribute to the body of knowledge by exploring a gap in literature, combining the fields of corporate real estate management theory and organisation theory.

2. RESEARCH PROCESS

TOPIC OF RESEARCH

Starting the graduation process, I already knew my main field of interest: public real estate management. Finding a specific research topic was much more difficult and took a while. Starting the research I was struggling a lot with determining my field of interest.

During the P1, I could not choose a specific research topic, because I was interested in several topics within public real estate management. Just a week before the P1, I had formulated my research problem and questions, which also made me struggle with my time management. Once deciding on studying the relation between organisational management (initially decentralisation) and real estate management, I had trouble deciding in which context I wanted to study this relationship. My initial interest was studying the real estate management process in government organisations, such as the Dutch Central Government Real Estate Agency. This initial interest was presented at the P1.

Working towards the P2, the graduation research got a broader topic and context. The research question moved away from the relationship between decentralisation on the Dutch central government towards the relationship between organisational structure and the real estate decision-making process of public organisations. The context changed from the central government, to four different sector within the public sector: universities, hospitals, police and colleges.

Towards the P3, a first explorative interview changed the scope of the research. The interview was with a formal teacher of mine, who has worked in the education and police sector and has loads of knowledge in this field of research. After the interview it became clear I needed to narrow down the scope of the research, otherwise it would not be feasible. From that moment on, the research context changed to the university real estate sector, and the final research question was formulated. During the P3 period, most interviews were conducted, and case studies were created.

Moving towards the P4 was the most difficult process of the graduation projects. Formulating conclusions was the most challenging task. In addition to this, I also had to postpone the P4, which made it difficult to not lose focus and keep working.

PROCESSING FEEDBACK

At first, I had difficulties processing feedback into the graduation research, as I did not even know what my own field of interest was. I was focused on studying a broad context, and not choosing a specific topic. Not processing the feedback to narrow down the scope sooner, created a difficult situation at the P2: the scope was too broad and too undefined yet. However, after the P2, the feedback helped me a lot with structuring the data and the graduation report in a logical manner. My difficulties with making quick decisions and the tendency to keep things undefined and in the middle for too long has definitely affected the research process: I waited too long on occasions to ask for feedback.

3. RESEARCH METHOD AND APPROACH

The following section elaborates on the research method and approach in relation to the methodical line of inquiry, while reflecting upon the scientific relevance of the work.

The research uses a case study approach and uses several research methods to collect data: a literature study, a document analysis and semi-structured interviews. Case study methodology is a form of qualitative research.

The idea to use a case study approach was created to the course *"Case Study Methods"* from the master track Management in the Built Environment. Prior to the graduation project, I have never conducted a research, apart from the scientific papers that were part of different courses in my bachelor and master. Following this course before starting the graduation project helped me in deciding on the research approach and already gave me some insights in how case study research is conducted. Considering the type of research question, it was a good decision to use a case study approach. Although the research topic and question were altered several times, the field of research stayed the same: real estate management within the public sector. Considering the scale and complexity of the real estate management process in the public sector, a case study approach would be most suitable to find an answer that is applicable to the whole sector.

LITERATURE STUDY

Finding relevant studies and research was quite easy. Having a bachelor of Architecture, Urbanism and Building Sciences and studying Management in the Built Environment in the last two years, have provided me already with a large body of knowledge concerning the discipline of managing real estate. Using the knowledge I already had, a theoretical background for the study was quickly created. However, limited research has focused on the influence of organisational management on university real estate management. Combining two different fields of research can be difficult, especially when the scientific body of knowledge is limited.

CASE STUDY: DOCUMENT ANALYSIS AND SEMI-STRUCTURED INTERVIEWS

The decision to conduct a document analysis was made after the P2. During the preparations for the empirical research, I realised I first needed to learn more about the organisational context of the four universities. Also, a lot of information on universities and their organisation is already written, as universities publish reports and plans that are publicly available, such as annual plans of the university and real estate plans from the real estate organisation. Gaining information in the context of Dutch universities helped me set up better, more directive questions for the empirical research.

Following the case-study approach, a logical decision was to use interviews as empirical research. Having never conducted interviews, I was very apprehensive and nervous at first. Formulating the right questions, and how to follow up on questions turned out to be quite difficult. However, throughout the graduation process, and conducting more and more interviews, this became easier.

When reflecting on whether the chosen research method and approach have 'worked', I would say that the decision to use a case study approach, and a literature study, a document analysis and semi-structured interviews as research methods, was a good decision. The aim of the study was to provide a better understanding of the relation between organisational structure and university real estate management. The objective was to provide university real estate organisations with a toolbox consisting of information and tools to support them in making decisions about the structuring of their organisation and the management of their real estate. By studying several university real estate organisations, the study was able to show how different organisational decisions can impact the real estate management process in different ways. As a result of this, a toolbox could be designed that is applicable to the whole university sector.

4. ETHICAL DILEMMANS

When considering the ethical aspects of the chosen research subject and research methodology, a note has to be made about the protection of the privacy of individuals. To counter the risk of individuals being personally assessed on the statements they make during the interviews, the decision is made to anonymise the interviews and not publish the names, nor profession of the interviewees in the research. However, not making this information available affects the accountability of the research: the reader cannot verify whether the obtained data originates from a trustworthy source.

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APPENDICES

APPENDIX I
ORGANISATIONAL STRUCTURE | DELFT UNIVERSITY OF TECHNOLOGY

The organisational structure of Delft University of Technology is analysed in the following section. The role of real estate management within the university is determined by the organisational structure of TU Delft, the organisational structure of Campus and Real Estate, and five structural choices: grouping of departments, level of sourcing, level of centralisation, level of concentration, and the position of the real estate department.

ORGANISATIONAL STRUCTURE

DELFT UNIVERSITY OF TECHNOLOGY

The organogram of TU Delft is shown in Figure I.1. As shown in the figure, TU Delft has eight faculties. The university's primary tasks – education, research and valorisation – are carried out by the faculties (TU Delft, 2018a). The organisation of TU Delft distinguishes three administrative layers: the Executive Board, the faculties and the academic departments (TU Delft, 2018a). All three layers are responsible for both the primary process and support processes (TU Delft, 2018b). The support services are grouped in the University Corporate Office. The University Corporate Office provides services for the primary processes in the organisation, organises the administrative processes, and coordinates the central policy processes (TU Delft, 2018b). The University Corporate Office consists of ten departments, including the Campus & Real Estate department.

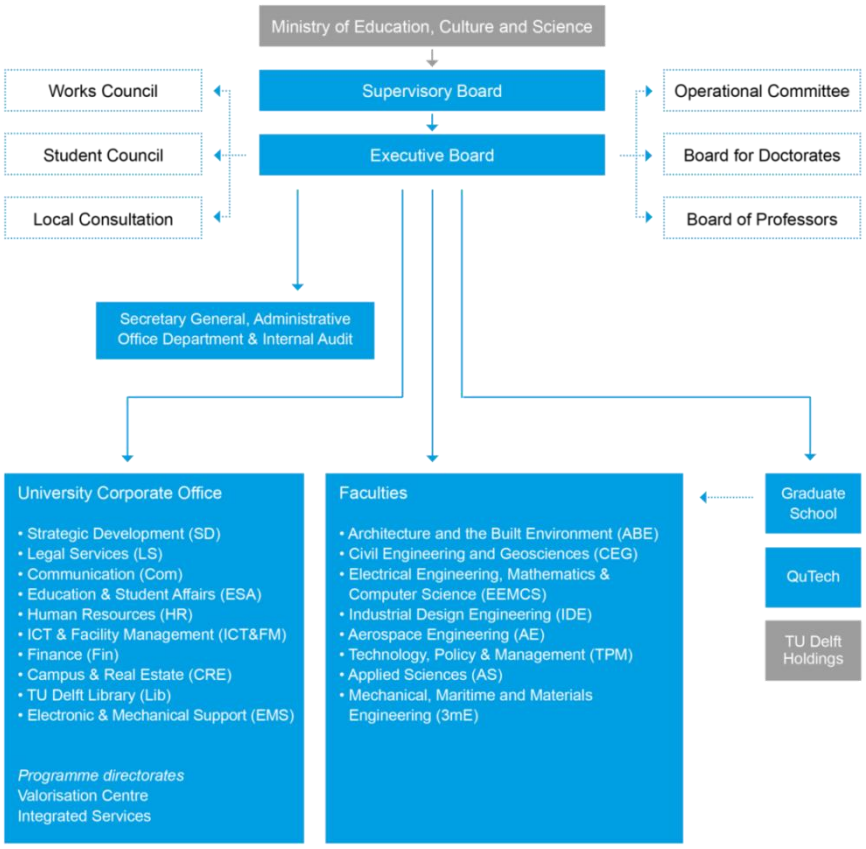

Figure I.1 – Organogram Delft University of Technology (TU Delft, 2018b)

REAL ESTATE DEPARTMENT

The real estate department of TU Delft, which is called Campus and Real Estate (CRE), is part of the University Corporate Office. The department CRE develops and manages the real estate and ground of TU Delft. Campus and Real Estate provides facilities and buildings to support TU Delft's primary process: education, research and valorisation (TU Delft, 2019).

The department Campus and Real Estate consists of five line departments and three support functions. Each department has its own manager. Each department manager is a member of the management team of the CRE department, and the head of the management team is the director of the CRE department (TU Delft, personal communication, February 25, 2019). The organogram of the Campus and Real Estate department is illustrated in Figure I.2.

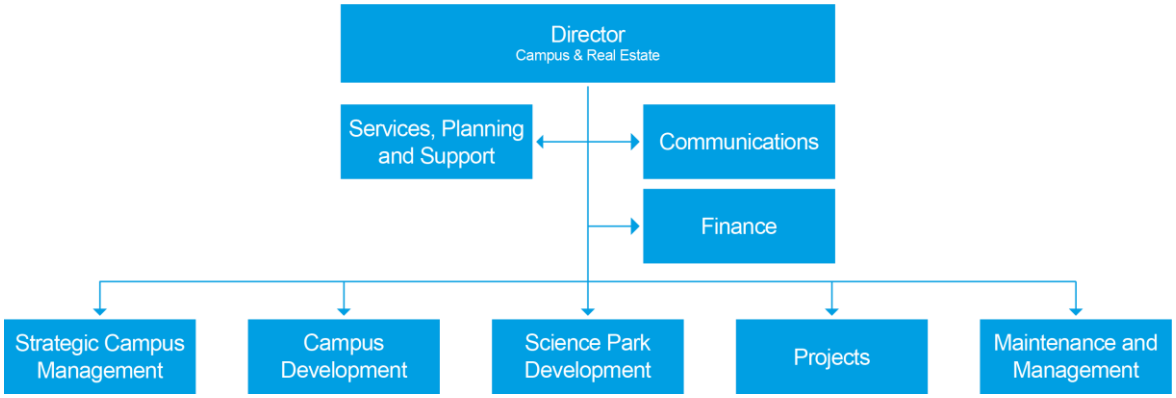

Figure I.2 – Organogram TU Delft department CRE (own illustration based on interviews)

The CRE department consists of five line departments (TU Delft, 2019):

- Strategic Campus Management
  The Strategic Campus Management department develops campus strategy and policy for TU Delft, which results in the formulation of a real estate strategy and a real estate policy. Additionally, the department is responsible for the management and operation of buildings, public areas and facilities. The elaboration and implementation of the development projects are handed over the departments of Campus Development and Science Park Development.

- Campus Development
  Campus Development develops spatial and real estate development projects for research and education. After defining the project, the responsibility of the project is transferred to the Projects department.

- Science Park Development
  The Science Park Development department focuses on strengthening the valorisation of TU Delft. The Science Park encompasses the entire TU Delft grounds. The department does not develop real estate, but only facilitates the needs of the businesses community.

- Projects
  The Projects department is responsible for acquisition, preparation, construction and delivery of real estate projects. The department is responsible for the entire project management process. Once a project is completed, the maintenance and management of the real estate asset are transferred to the Maintenance and Management department.

- Maintenance and Management
  Maintenance and Management is responsible for the technical management and maintenance of TU Delft's buildings and grounds. The department provides the Strategic Campus Management department with information on long-term maintenance.

Furthermore, there are several support functions, such as Finance, Communication, and Services, Planning and Support. The support departments assist the CRE line departments in achieving the campus vision and operating the TU Delft Campus. Services, Planning and Support is divided into teams for contract management, information management, quality management, and secretarial services (TU Delft, 2019). The departments Finance and Communications are independent departments with each its own manager (TU Delft, personal communication, February 25, 2019). The real estate department also has a Human Resources department. However, this department is part of Services, Planning and Support, and does not have its own manager (TU Delft, personal communication, February 25, 2019).

The structure of the real estate department has changed recently. Before 2017, real estate management was grouped together with facility management, and formed one combined department; Facility Management and Real Estate (FMRE). The FMRE department was set up in 2006 as part of a major reorganisation of TU Delft's supporting services (TU Delft,

2006; TU Delft, personal communication, April 29, 2019). In 2017 it was decided, by the Executive Board and the director of FMRE, to separate the two services (TU Delft, personal communication, April 29, 2019). Facility management has become a part of the IT department. One of the reasons for this was the ever-growing complex real estate challenges (TU Delft, personal communication, April 29, 2019). Facility management concerns the daily operational services, is service-oriented, and focuses on short-term. Real estate management focuses on the management of real estate on the long-term, and is concerned with the future impact and potential of real estate for the organisation. The complex real estate challenges call for a thorough long-term real estate strategy. A professional real estate department is needed in such a situation. However, this creates a greater difference in focus between a day-to-day service department, such as FM, and a multi-year operating real estate department. By separating the two services, the real estate department is able to focus entirely on these real estate challenges (TU Delft, personal communication, April 29, 2019).

GROUPING OF DEPARTMENTS

The Campus & Real Estate department is the largest support service of TU Delft; the department has approx. 200 to 250 employees (TU Delft, personal communication, July 11, 2019). In terms of organisational structure and grouping of departments, the real estate department differentiates itself from the University Corporate Office. As can be seen in the organogram in Figure I.1, the University Corporate Office groups its department by functions: legal services, communication, human resources, real estate management, finance, IT, etc. As can be seen in the organogram in Figure I.2, Campus & Real Estate is divided into five line departments that are grouped by the different services provided by the department. To conclude, the CRE department has a *divisional* structure: its departments are grouped by products. The services provided by the real estate department can be considered the products of the departments. The different products and departments of the CRE department are discussed in the section above.

Figure I.3 – University Corporate Office: functional grouping (Daft, Murphy & Willmot, 2010) edited

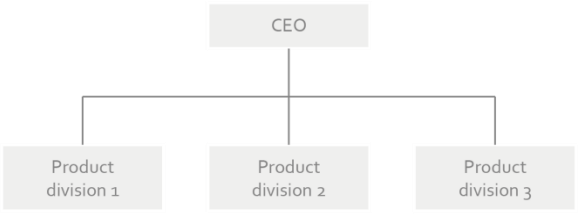

Figure I.4 – Campus & Real Estate department: divisional grouping (Daft, Murphy & Willmot, 2010) edited

LEVEL OF CENTRALISATION

TU Delft's real estate department is part of the University Corporate Office, which takes a central place in the organisation. All real estate related decisions are made by the Campus and Real Estate department (TU Delft, personal communication, February 25, 2019; TU Delft, personal communication, April 29, 2019). Thus, TU Delft has a *centralised* real estate decision-making structure (see Figure I.3). Every faculty also has a Campus and Real Estate department, which is part of the faculty's supporting staff. This department supports all building related matters at faculty level. However, the department has no decision-making authority (TU Delft, personal communication, April 29, 2019).

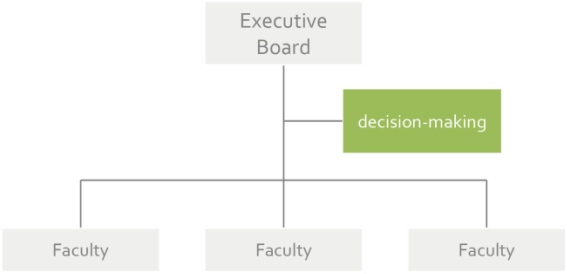

Figure I.3 – Centralised decision-making authority (Bank & den Heijer, 2004) edited

Even though the real estate decision-making authority is centralised, the management team of Campus & Real Estate has to report to the Executive Board, and the Executive Board has to approve real estate decisions (TU Delft, personal communication, February 25, 2019). Which real estate decisions have to be approved by the Executive Board, and which have to be approved by the management team of CRE, depends on two things: the Mandate Regulations of TU Delft, and the investment costs of the related real estate intervention (TU Delft, personal communication, February 25, 2019).

The Mandate Regulations concerns the powers of the Executive Board. The Executive Board delegates powers to the deans of the faculties and the directors of the University Corporate Office (TU Delft, n.d.-a). Thus, the director and the department managers of Campus and Real Estate have certain decision-making powers. Table I.1 provides an overview of the decision-making powers related to real estate of both the Executive Board and the director of Campus & Real Estate.

The investments costs of real estate interventions also determine who has the authority to make decisions. When the investments costs are high – more than €1.000.000 – the Executive Board has to decide. For investments costs lower than €150.000, the Campus & Real Estate department can make decisions. Table I.2 provides an overview of the decision-making authorities based on investments costs.

In addition to the Executive Board and the Campus & Real Estate department, the faculties also have a certain decision-making authority related to real estate. The faculties are responsible for the daily management of their real estate (TU Delft, n.d.-a; TU Delft, personal communication, February 25, 2019). The daily management of real estate concerns small maintenance, purchasing furniture, etc.

Executive Board	Director CRE
rental agreements that have an revenue of more than €50.000	rent or lease TU Delft's properties to third parties, insofar as the agreement has an revenue of no more than €50.000.
rental agreements that exceed a commitment of three years	rental agreements with a commitment of three years or less
agreements with regard to the renovation of exiting real estate that exceed the total available budget	agreements with regard to the renovation of exiting real estate insofar as the total available budget is not exceeded
maintenance agreements that exceed the total available budget	maintenance agreements insofar as the total available budget is not exceeded
agreements with regard to the construction of real estate	taking measures with regard to TU Delft's properties with regard to safety and environmental aspects
agreements with regard to the purchase or sale of real estate	

Table I.1 – Decision-making power Executive Board and Campus and Real Estate department (based on Mandate Regulations TU Delft)

Function	Limit
Department Manager	≤ € 25.000
Director Campus and Real Estate	≤ € 150.000
Director University Corporate Office	≤ € 1.000.000
Executive Board	≥ € 1.000.000

Table I.2 – Decision-making authorities based on investment costs (based on Mandate Regulations TU Delft)

LEVEL OF CONCENTRATION

In addition to the Campus and Real Estate department, TU Delft also has smaller real estate departments that are part of the faculties. The real estate departments at faculty level have no decision-making authorities. However, these smaller real estate departments are responsible for the operational management of the faculties' real estate (TU Delft, personal communication, April 29, 2019). Thus, the operation of real estate activities is *deconcentrated* (see Figure I.4). The faculty's real estate department is responsible for building management, which includes maintenance of technical installations and building facilities, providing a sustainable building, and making sure the building is safe (TU Delft, 2019).

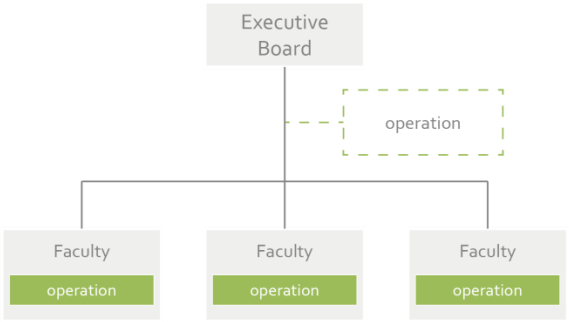

Figure I.4 – Deconcentrated operation of real estate activities (Bank & den Heijer, 2004) edited

LEVEL OF SOURCING

The Campus and Real Estate department outsources certain real estate activities. However, this concerns only technical management and maintenance activities, which are the responsibility of the Maintenance & Management department (TU Delft, personal communication, February 25, 2019). The Maintenance & Management department only manages the outsourced activities, and an external party is responsible for the execution of the activities. To conclude, only certain operational management activities are outsourced, while all strategic and tactical activities are kept in-house. Thus, Campus and Real Estate has an *administrative organisation* (see Figure I.5).

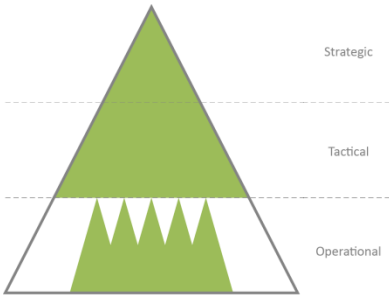

Figure I.5 – Administrative model (de Jong et al., 2013) edited

POSITION OF THE REAL ESTATE DEPARTMENT

The Campus & Real Estate department has little decision-making authority and needs approval from the Executive Board for larger financial decisions. The decision-making authority of the real estate department is determined by two things: the Mandate Regulations of TU Delft, and the investments costs of the related real estate interventions (TU Delft, personal communication, February 25, 2019). As discussed in the section 'Level of centralisation', the real estate department can make decisions regarding renting or leasing properties to third parties, insofar the agreements have a revenue of no more than €50.000, and with a commitment of three years or less. The real estate department can make agreements or take measures as long as the budget is not exceeded. In terms of investment costs, the real estate department can make decisions regarding real estate projects, insofar the investment costs do no exceed €150.000. The Mandate Regulations of TU Delft and the investment costs of real estate interventions leave little room for decision-making powers within the real estate department. To conclude, the little decision-making authority and the need for approval of the Executive Board indicate a high position of the real estate department; close to the Executive Board (see Figure I.6).

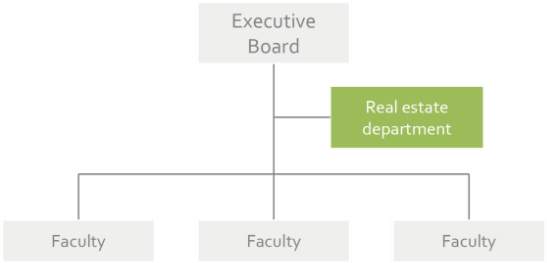

Figure I.6 – High position of the real estate department: close to the Executive Board (Bank & den Heijer, 2004) edited

APPENDIX II
ORGANISATIONAL STRUCTURE | WAGENINGEN UNIVERSITY & RESEARCH

The organisational structure of Wageningen University & Research is analysed in the following section. The role of real estate management within the university is determined by the organisational structure of WUR, the organisational structure of Real Estate and Housing, and five structural choices: grouping of departments, level of sourcing, level of centralisation, level of concentration, and the position of the real estate department.

ORGANISATIONAL STRUCTURE

WAGENINGEN UNIVERSITY & RESEARCH

The organisational structure of WUR is illustrated in Figure II.1. As shown in the figure, WUR has only one faculty, and is organised into five science groups (WUR, 2018a). Each science group consists of a Wageningen University department, which is organisationally integrated with one or more institutes of Wageningen Research (WUR, 2018a). However, Wageningen University and Wageningen Research are separate administrative and legal entities (WUR, 2018a). Since research is an integral part of the university, the Executive Board of WUR is different in comparison to the Executive Boards of other Dutch universities (WUR, personal communication, March 22, 2019). The Executive Board of Wageningen University consists of the same members as the Executive Board of Wageningen Research (WUR, 2018a

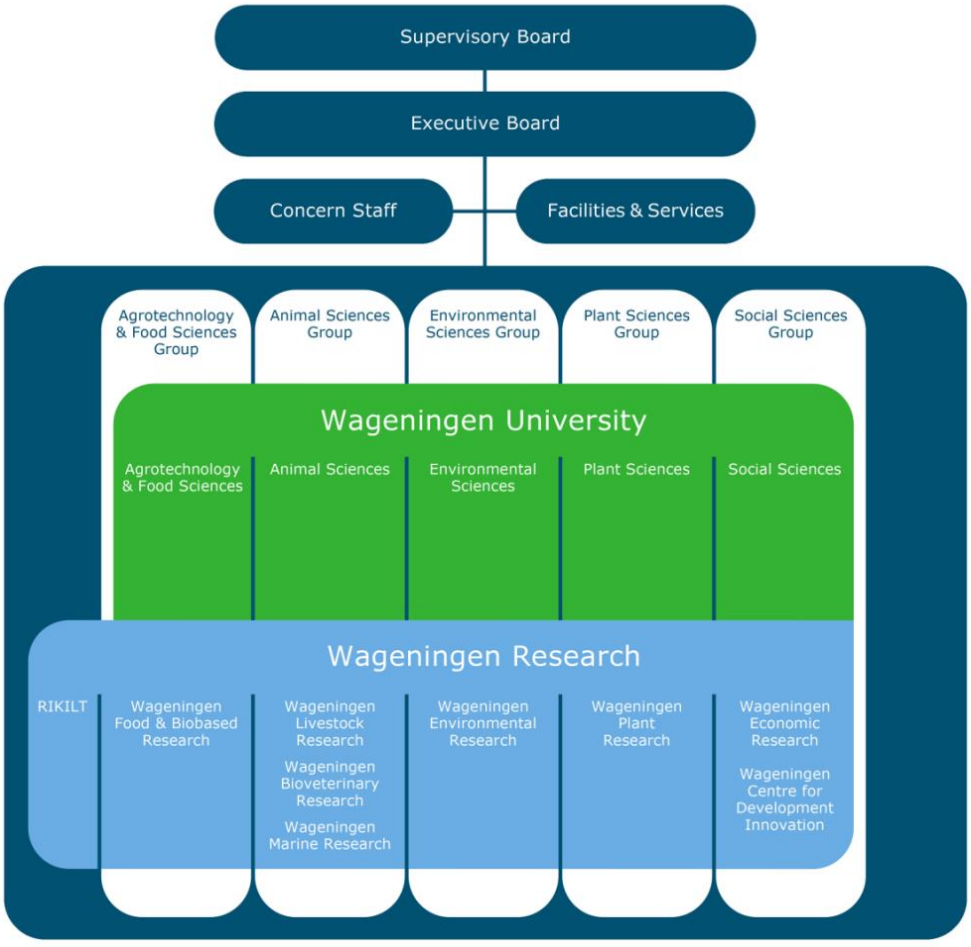

Figure II.1 – Organogram Wageningen University & Research 2018 (WUR, 2018a)

The support services of WUR are concentrated in the Concern Staff and Facilities & Services. The Concern Staff provides services for students and staff, and advises the Supervisory Board and Executive Board (WUR, 2018a). The Concern Staff consists of seven departments: Education & Student Affairs, Strategy & Accounts, Value Creation, Finance & Control, Governance & Legal Services, Human Resources, and Communication. Facilities & Services is responsible for services such as IT, the Library and operational services (WUR, 2018a). Facilities & Services also is responsible for the WUR campus and real estate (WUR, 2018a). Facilities & Services is divided into six departments: Purchasing, Information Technology, Real Estate, Library WUR, Operational Services, and Location Facilities (WUR, 2018a). Figure II.2 shows the organisational structure of the Facilities & Services department.

Around twelve years ago, the Executive Board decided to centralise all support services into one organisational unit: the Facilities & Services Department (WUR, personal communication, March 22, 2019). The reason behind this centralisation, and the creation of Facilities & Services, was to provide customers and users with uniform services, and improved facilities and services (WUR, n.d.-d). After the centralisation, it took three years before the Facilities & Services department got its current structure (WUR, personal communication, March 22, 2019). After those three years, the unit found and acquired its place in the organisation (WUR, personal communication, March 22, 2019). Around five years ago, the unit became really 'in control' of its processes (WUR, personal communication, March 22, 2019).

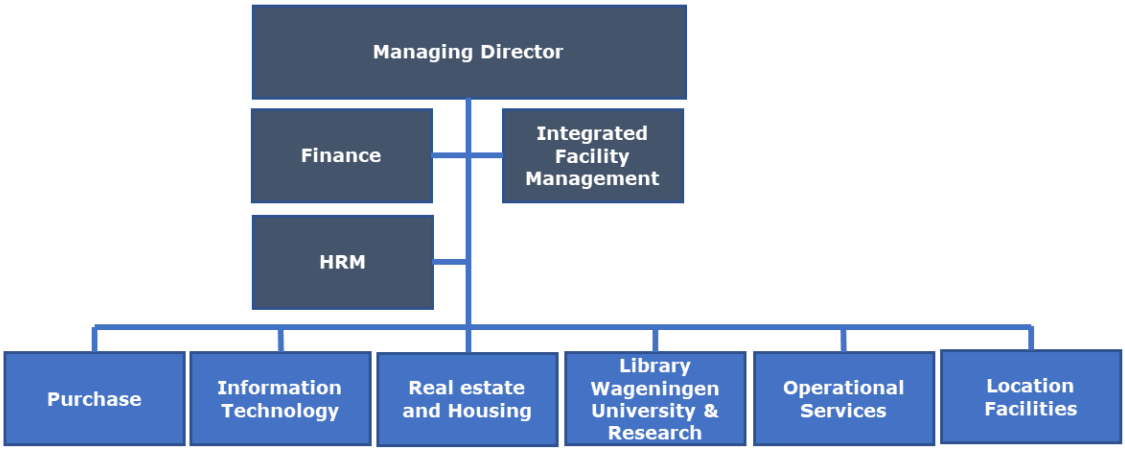

Figure II.2 – Organogram Facilities and Services department 2015 (WUR, n.d.-a)

REAL ESTATE DEPARTMENT

The real estate department of Wageningen University & Research is part of the Facilities & Services (FS) department, and is called Real Estate & Housing (RE&H). The department RE&H develops, manages and maintains WUR's building stock (WUR, n.d.-b). Real Estate & Housing advises and supports WUR's organisational units in their decision-making regarding real estate (WUR, personal communication, March 22, 2019). In addition, RE&H works together with WUR's organisational units to optimise their space use (WUR, personal communication, March 22, 2019).

WUR considers itself to be a Machine Bureaucracy (WUR, personal communication, March 22, 2019). Real Estate & Housing is a support staff department that operates in the field of real estate. The products and services of the real estate department are regulated by formalised rules and procedures. The configuration of the university is characterised by a high degree of standardisation of work processes – planning and control cycles – is bureaucratic, and focuses on cost control (WUR, personal communication, March 22, 2019).

The department RE&H consists of five departments and is supported by a secretariat. The management team of Real Estate & Housing consists of the director of RE&H and the department managers (WUR, personal communication, March 22, 2019). Figure II.3 presents the organisational structure of Real Estate & Housing.

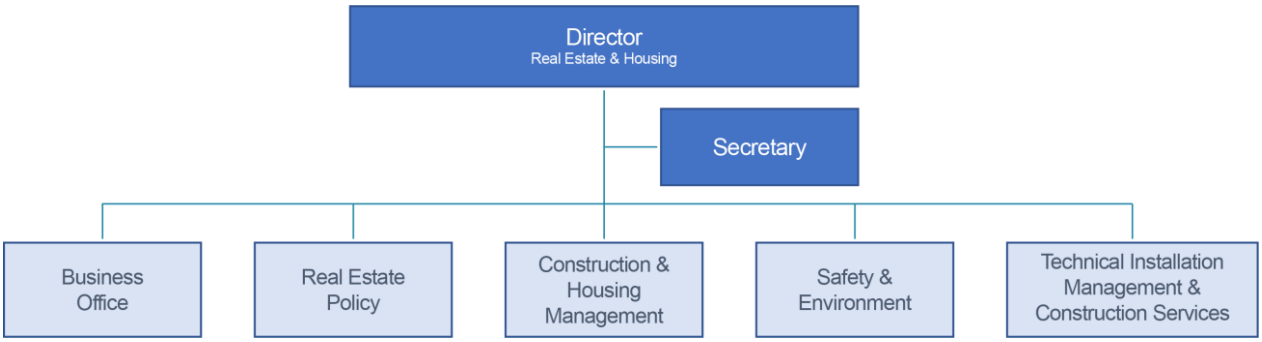

Figure II.3 – Organogram Real Estate and Housing department (own ill. based on interview)

Real Estate and Housing consists of five departments (WUR, personal communication, March 22, 2019):

- Business Office
  The Business Office focuses on the legal administration and real estate administration.
- Real Estate Policy
  The Real Estate Policy section focuses on the future development of the real estate portfolio, and is responsible for new construction developments, and the design of the long-term real estate strategy. Real Estate Policy works closely together with the users of WUR's real estate and the Executive Board to create the real estate strategy.
- Construction & Housing Management
  The Construction & Housing Management section focuses on maintaining WUR's real estate properties, and supervising all real estate projects.
- Safety & Environment
  The Safety & Environment section focuses on ensuring compliance with (environmental) legislation and regulations regarding the built environment, and focuses on sustainability.
- Technical Installation Services & Construction Services Wageningen
  The Technical Installation Services section is responsible for the 24/7 emergency services. The Construction Services section is responsible for construction projects.

GROUPING OF DEPARTMENTS

The Real Estate & Housing department of WUR is part of the Facilities & Services department. In terms of organisational structure and grouping of departments, the real estate department differentiates itself from the FS department. The FS department has a functional structure: its departments are grouped by functions (see Figure II.4) (WUR, personal communication, March 22, 2019). The RE&H has a *divisional* structure: its departments are grouped by products (see Figure II.5) (WUR, personal communication, March 22, 2019). The functions and departments of the FS department are the different support services: Purchasing, Information Technology, Real Estate, Library WUR, Operational Services, and Location Facilities. The products and departments of Real Estate & Housing are elaborated on in the section above.

Figure II.4 – Facilities & Services department: functional grouping (Daft, Murphy & Willmot, 2010) edited

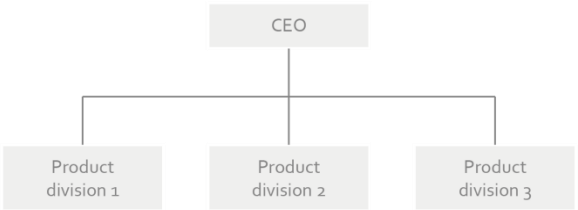

Figure II.5 – Real Estate & Housing department: divisional grouping (Daft, Murphy & Willmot, 2010) edited

LEVEL OF CENTRALISATION

Wageningen University & Research has a central real estate department – Real Estate & Housing – which is part of the department Facilities & Services. The faculty does not have its own real estate department (WUR, personal communication, March 22, 2019), which means that all real estate decision-making powers are located at the RE&H department. Thus, WUR has a *centralised* real estate decision-making process (see Figure II.6).

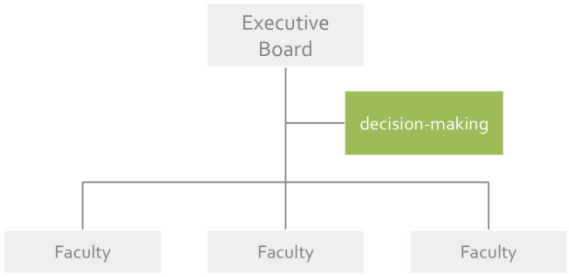

Figure II.6 – Centralised decision-making authority (Bank & den Heijer, 2004) edited

The department Real Estate & Housing has to report to two other organisational units (WUR, personal communication, March 22, 2019): the director of the department Facilities & Services, and the Executive Board. The first line of can be considered a short line; the RE&H department proposes plans, together with an overview of the costs, to the director of Facilities & Services, and the director makes a decision (WUR, personal communication, March 22, 2019). The second line of reporting is for more complex projects, which are outside the mandate of the director of Facilities & Services. The RE&H department proposes the plans to the Executive Board, and the Executive Board makes a decision (WUR, personal communication, March 22, 2019). Decisions that are outside the mandate of Facilities & Services include large and complex projects, and projects with a large impact for the university (WUR, personal communication, March 22, 2019). According to the Administrative and Management Regulations of WUR (2018b), the Executive Board is responsible for authorising agreements with regard to the construction of real estate, and the purchase or sale of real estate. The director of Facilities & Services is only authorised to make decisions regarding renting or leasing WUR's real estate properties to third parties.

LEVEL OF CONCENTRATION

The university only has one central real estate department – Real Estate & Housing – that is responsible for all real estate related issues. In addition to having the real estate decision-making authority, the RE&H department is also responsible for the operation of the real estate activities (WUR, personal communication, March 22, 2019). The real estate activities are thus concentrated in a central place in the organisation.

Even though there is one central real estate department, each organisational unit does have its own location manager that is responsible for the supporting services (WUR, personal communication, March 22, 2019). These location managers are employed at the department Facilities & Services, but they each are delegated to an organisational unit (WUR, personal communication, March 22, 2019). Thus, each location manager represents a particular organisational unit. Since the location managers are employed at level of the organisational units, the department Facilities & Services can be easily informed on issues relating to supporting services, and the department can act quickly. The location manager does not only focus on real estate services, but on all supporting services. Therefore, the department Facilities & Services can be considered a *shared service center*, in which all support services are *integrated*. To conclude, the operation of real estate activities is concentrated in a shared service center (see Figure II.7).

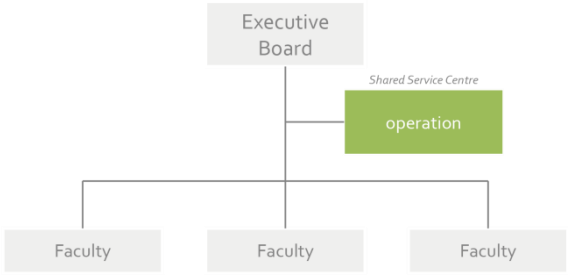

Figure II.7 – Concentrated operation of real estate activities (Bank & den Heijer, 2004) edited

LEVEL OF SOURCING

The RE&H department outsources some of its operational real estate activities to external service providers (WUR, personal communication, March 22, 2019). The real estate department takes on a directing role when outsourcing activities; Real Estate & Housing manages the real estate activities and several external service providers are responsible for the execution of the activities. An example of one of the outsourced real estate activities is design, when the external service provider is an architect (WUR, personal communication, March 22, 2019). To conclude, only certain operational real estate activities are outsourced, while all strategic and tactical activities are kept in-house. Thus, Real Estate and Housing has an administrative organisation (see Figure II.8).

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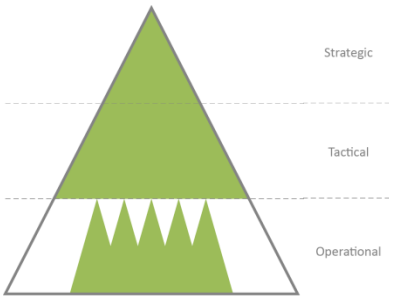


Figure II.8 – Administrative model (de Jong et al., 2013) edited

POSITION OF THE REAL ESTATE DEPARTMENT

The Real Estate & Housing department has little decision-making authority and needs approval from either the director of the Facilities & Services department or from the Executive Board for larger financial decisions. The RE&H department has two reporting lines (WUR, personal communication, March 22, 2019): one short line to the director of Facilities & Services; the director of FS is authorised to make decisions regarding renting or leasing WUR's real estate properties to third parties (WUR, 2018b). The second reporting line is for more complex projects that are outside the mandate of the RE&H department and the director of Facilities & Services; this reporting line includes the communication between Real Estate & Housing and the Executive Board of WUR (WUR, personal communication, March 22, 2019). The two reporting lines indicate that the RE&H department needs approval for most real estate decisions. Thus, the RE&H department has little decision-making powers. The little decision-making authority and the need for approval of the director of Facilities & Services and the Executive Board indicate a high position of the real estate department; close to the Executive Board (see Figure II.9).

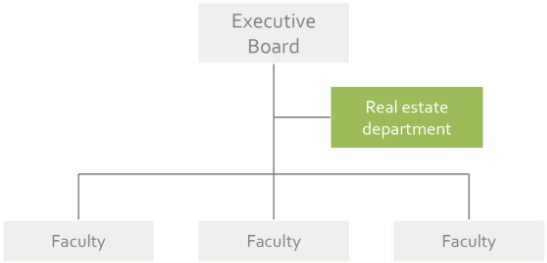


Figure II.9 – High position of the real estate department: close to the Executive Board (Bank & den Heijer, 2004) edited

APPENDIX III
ORGANISATIONAL STRUCTURE | UTRECHT UNIVERSITY

The organisational structure of Utrecht University is analysed in the following section. The role of real estate management within the university is determined by the organisational structure of UU, the organisational structure of Corporate Real Estate & Campus, and five structural choices: grouping of departments, level of sourcing, level of centralisation, level of concentration, and the position of the real estate department.

ORGANISATIONAL STRUCTURE

UTRECHT UNIVERSITY

UU's organisational structure comprises two levels: the central level of the university, and the level of the faculties and the service departments (University Utrecht, n.d.-d). As shown in Figure III.1, Utrecht University has seven faculties and two support services (UU, 2019a). The service departments are concerned with providing management services for the university, and carrying out support services on behalf of the Executive Board (UU, 2019a).

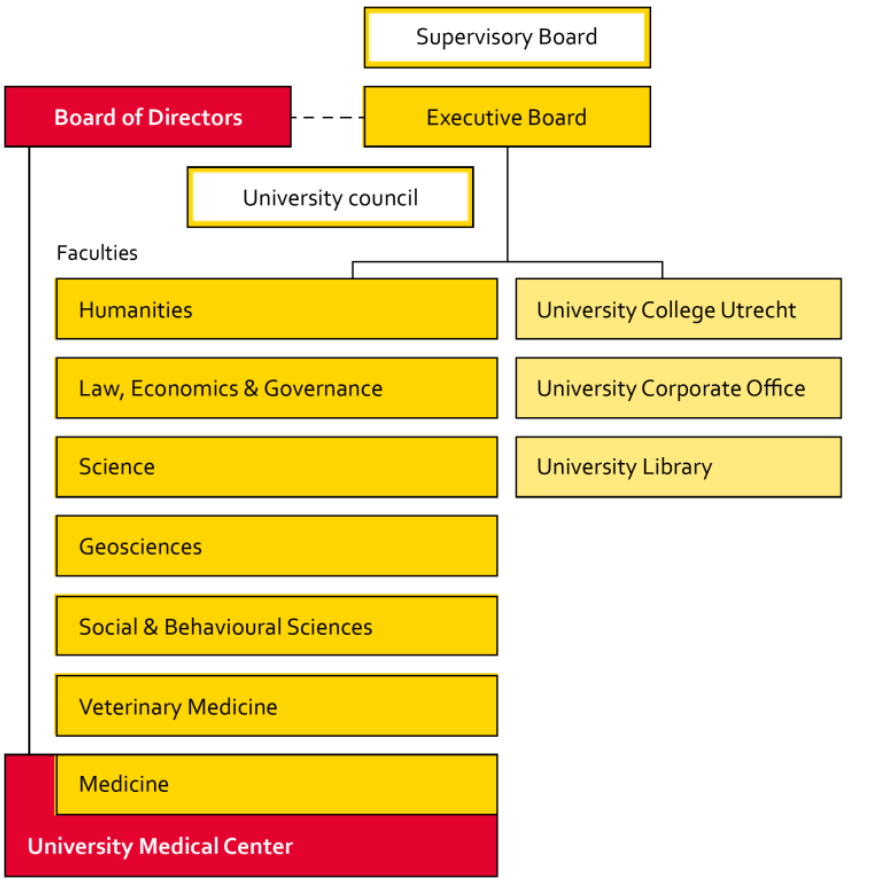


Figure III.1 – Organogram Utrecht University (UU, 2019a)

REAL ESTATE DEPARTMENT

The real estate department of Utrecht University, which is called Corporate Real Estate & Campus (CRE&C), is part of the University Corporate Office. CRE&C advises the Executive Board and the faculties on the development and management of university real estate (Universiteit Utrecht, n.d.-c). The department realises housing for teaching and research, ensures a safe and sustainable work and study environment, and develops an area where knowledge is shared (UU, n.d.-c). Figure III.2 presents the organisational structure of Corporate Real Estate & Campus.

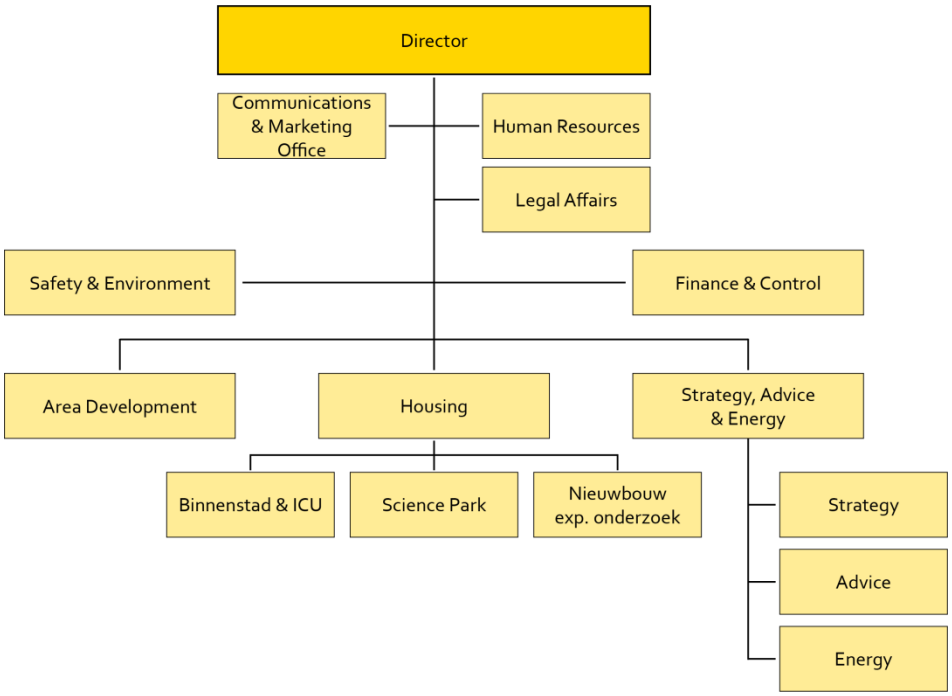


Figure III.2 – Organogram Corporate Real Estate & Campus (own ill. based on interview)

Corporate Real Estate & Campus consists of three line departments and two staff departments (UU, n.d.-c; UU, personal communication, April 5, 2019):

- Housing
  Housing is responsible for realising housing for teaching and research with optimal conditions for students, teachers, researchers and support staff. Due to the size of the portfolio, the department Housing is subdivided into two regions: Binnenstad & ICU and Science Park. Binnenstad. The department Nieuwbouw Experimenteel Onderzoek (NEO) is responsible for programming and realising accommodation for experimental research.

- Area Development
  The department Area Development is responsible for the development of the university campuses.

- Strategy, Advice & Energy
  The department Strategy, Advice & Energy (SAE) consists of three smaller departments: Strategy, Advice and Energy. The Strategy department is concerned with portfolio management on both housing level and area development level. The portfolio managers are responsible for updating the Strategic Housing Plan, conducting strategic feasibility studies, asset management, developing new innovations or implementing current trends, and controlling the effectiveness of the real estate portfolio. The Advice department is concerned with providing technical advice in the field of installations, sustainability and sustainable innovations. The Energy department is responsible for the energy supply on campus.

- Safety & Environment *(staff department)*
  Safety & Environment ensures a safe and sustainable work and study environment, and is responsible for promoting and monitoring the security within the UU.

- Finance & Control *(staff department)*
  The FCW department is concerned with the financial management of both Corporate Real Estate and Campus and Facility Services (UU, personal communication, April 5, 2019). FCW is responsible for the planning and control cycles, and efficient administrative management and a consistent administrative organisation (UU, n.d.-e).

Furthermore, the CRE&C department has several support services: Communications & Marketing Office, Human Resources, and Legal Affairs.

REORGANISATION

In 2018, the department CRE&C has been reorganised; as well as the Facility Services (FS) department, which is also part of the University Corporate Offices (UU, personal communication, April 5, 2019). Both departments are concerned with UU's real estate (UU, personal communication, April 5, 2019). The aim of the reorganisation was to become more customer-oriented, rather than task-oriented (UU, personal communication, April 5, 2019). The reorganisation focused on separating and joining several departments and functions in order to promote and stimulate collaboration and better results (UU, personal communication, April 5, 2019).

One of the services that became seperated with the reorganisation is the department Management and Maintenance; the department was transferred from CRE&C to the Falicity Services department (UU, personal communication, April 5, 2019). The CRE&C department now focuses more on the real estate development processes (UU, personal communication, April 5, 2019). After the reorganisation, a distinction is made in projects between the CRE&C department and the FS department: smaller projects with investments costs up to €250.000 are assigned to the CRE&C department; larger and more complex projects are assigned to the FS department (UU, personal communication, April 5, 2019).

GROUPING OF DEPARTMENTS

As can be seen in the organogram in Figure III.2, the CRE&C department is divided into three line departments and two staff departments. The two staff departments – *Safety & Environment* and *Finance & Control* – are grouped by function. The three line departments are grouped by products, with the products being the different services provided by the real estate department: area development, housing, and strategy, advice and energy. Thus, the real estate department has grouped its departments either by function or by products, depending on it being a line or staff department. To conclude, the CRE&C department has a matrix/hybrid structure: a combination of both a divisional and functional structure (see Figure III.3). The functions and products of the CRE&C department are elaborated on in the section above.

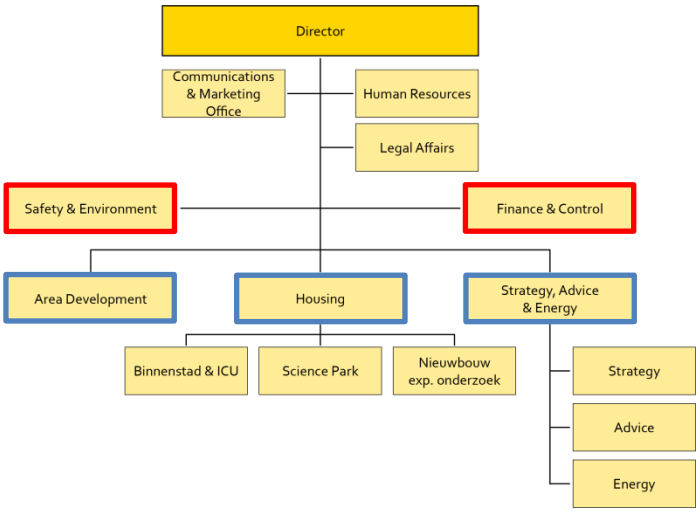


Figure III.3 – Organisational structure CRE&C department: combination divisional (blue)and functional (red) (own ill.)

LEVEL OF CENTRALISATION

Utrecht University has a central real estate department – Corporate Real Estate and Campus – which is part of the University Corporate Office. All real estate decisions are made by the central CRE&C department (UU, personal communication, April 5, 2019). UU does not have real estate departments at faculty level; however, each faculty has its own demand manager that coordinates the housing of its faculty (UU, personal communication, April 5, 2019). The demand manager does not have any decision-making authority (UU, personal communication, April 5, 2019). Therefore, UU has a *centralised* real estate decision-making process (see Figure III.4).

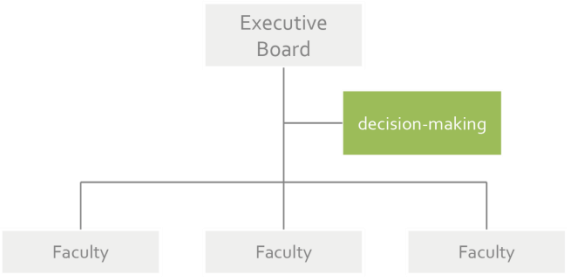


Figure III.4 – Centralised decision-making authority (Bank & den Heijer, 2004) edited

Although the real estate decision-making authority is centralised, the real estate department has to report directly to the director of the University Corporate Office, and thereby indirectly to the Executive Board (UU, personal communication, April 5, 2019). The reporting line to the Executive Board includes presenting real estate projects and their related investment costs, which are elaborated in a financial statement, and the Executive Board has to approve these projects (UU, personal communication, April 5, 2019). Before presenting the financial statement to the Executive Board, the projects

are discussed and agreed upon by the faculties (UU, personal communication, April 5, 2019). Which real estate decisions can be made by the real estate department, and which have to be approved by the Executive Board, depends on two things: the Mandate Regulations of Utrecht University, and the investment costs of the real estate projects (UU, personal communication, April 5, 2019).

The Mandate Regulations concern the powers of the Executive Board, and the power it delegates to the deans of the faculties and the directors and managers of the University Corporate Office (Universiteit Utrecht, 2018). The director, department managers and head of departments of Corporate Real Estate & Campus have certain decision-making powers. In terms of investments costs, the real estate department can make decisions up to a certain amount, while the Executive Board is responsible for deciding on projects with high costs (UU, personal communication, April 5, 2019). Table III.1 provides an overview of the decision-making authorities of both the Executive Board and the director of CRE&C. The department managers and heads of department also have a certain decision-making powers that only include the authority to enter into agreements up to a certain amount of money (UU, 2018). Table III.2 provides an overview of these decision-making powers. The heads of department and the department managers also have certain authority to approve financial costs of orders, declarations and invoices. Table III.3 provides an overview of this authority.

Executive Board	Director CRE&C
rental or leasing agreements that have an revenue of more than €500.000	rent or lease UU's real estate properties, insofar as the agreement has an revenue of no more than €500.000
real estate interventions regarding asbestos and concrete degradation that exceed €250.000	real estate interventions regarding asbestos and concrete degradation up to a maximum of €250.000
real estate interventions that overrun the budget that exceed €250.000, or 5% of the total budget	real estate interventions that overrun the budget up to a maximum of €250.000, or 5% of the total budget
real estate projects in the initiation phase that exceed €100.000	real estate projects in the initiation phase up to a maximum of €100.000
	functional interventions of real estate properties up to a maximum of €250.000 per property per year

Table III.1 – Decision-making power Executive Board and Corporate Real Estate & Campus department (based on UU, 2018)

Function	Limit
Head of Department	
- *Binnenstad & ICU* and *Science Park*	*≤ € 100.000*
- *Nieuwbouw Experimenteel Onderzoek*	*≤ € 250.000*
- *Strategy, Advice* and *Energy*	*≤ € 25.000*
Department Manager	
- *Safety & Environment* and *Finance & Control*	*≤ € 25.000*
- *Area Development, Housing* and *Strategy, Advice & Energy*	*≤ € 250.000*

Table III.2 – Authority to enter into agreements based on investment costs (based on UU, 2018)

Function	Limit
Head of Department	
- *Binnenstad & ICU* and *Science Park*	*≤ € 500.000*
- *Nieuwbouw Experimenteel Onderzoek*	*≤ € 1.000.000*
- *Advice*	*≤ € 100.000*
- *Energy*	*≤ € 500.000*
Department Manager	
- *Strategy, Advice & Energy* and *Housing*	*≤ € 1.000.000*
- *Area Development*	*≤ € 500.000*
Director Corporate Real Estate & Campus	≤ € 2.000.000
Executive Board	≥ € 2.000.000

Table III.3 – Authority to approve orders, declarations and invoices based on investment costs (based on UU, 2018)

LEVEL OF CONCENTRATION

Utrecht University has a central real estate department at university level that is responsible for all real estate related issues. The faculties do not have their own real estate department, but they do have a demand manager that is concerned with the faculty's real estate (UU, personal communication, April 5, 2019). The demand manager is responsible for the smaller internal projects, which are also coordinated with the Facility Services department (UU, personal communication, April 5, 2019). The demand managers work for the faculties; they are the representatives of the faculties. However, their tasks are centrally regulated by CRE&C (UU, personal communication, April 5, 2019). Therefore, UU has *concentrated* its real estate activities in a central place in the organisation (see Figure III.5).

LEVEL OF SOURCING

The real estate department hires external service providers for certain real estate related tasks. However, real estate activities are not completely outsources (UU, personal communication, April 5, 2019). Real estate activities that are executed by an external provider are related to lack of personnel or lack of knowledge and expertise (UU, personal communication, April 5, 2019). Thus, outsourced real estate activities only concern operational tasks. Although some real estate tasks are outsourced to external service providers; in general, all activities concerning real estate are managed by the real estate department itself. Therefore, the CRE&C department uses the *Administrative model* for outsourcing its real estate activities (see Figure III.6).

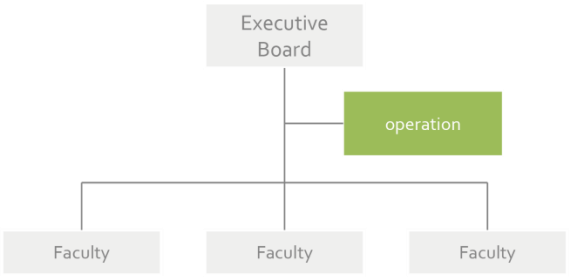


Figure III.4 – Concentrated operation of real estate activities (Bank & den Heijer, 2004) edited

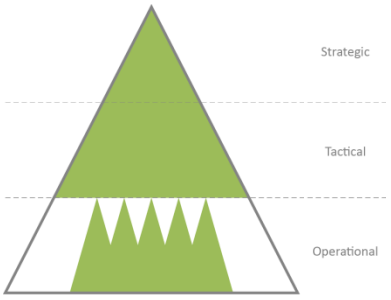


Figure III.5 – Administrative model (de Jong et al., 2013) edited

POSITION OF THE REAL ESTATE DEPARTMENT

The Corporate Real Estate & Campus department has little decision-making authority and needs approval from the Executive Board for larger financial decisions. The decision-making authority of the real estate department is determined by the Mandate Regulations of the university and the investment costs of the real estate projects (UU, personal communication, April 5, 2019). The real estate department can make decisions regarding renting or leasing properties, real estate interventions regarding asbestos and concrete degradation, real estate interventions that overrun the budget, real estate projects in the initiation phase, and functional interventions of real estate properties (UU, 2018). In terms of investment costs, the real estate department can make decisions to approve orders, declarations and invoices, insofar the investment costs do no exceed €1.000.000 (UU, 2018). The little decision-making authority and the need for approval of the Executive Board indicate a high position of the real estate department; close to the Executive Board (see Figure III.7).

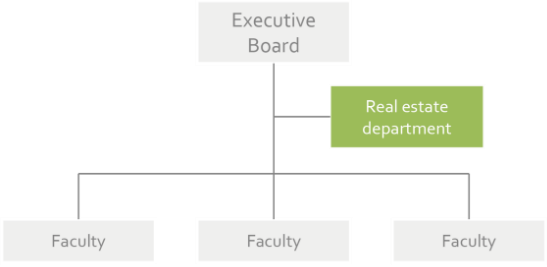


Figure III.7 – High position of the real estate department: close to the Executive Board (Bank & den Heijer, 2004) edited


Universiteit Twente
de ondernemende universiteit

APPENDIX IV
ORGANISATIONAL STRUCTURE UNIVERSITY OF TWENTE

The organisational structure of University of Twente is analysed in the following section. The role of real estate management within the university is determined by the organisational structure of UT, the organisational structure of Campus & Facility Management, and five structural choices: grouping of departments, level of sourcing, level of centralisation, level of concentration, and the position of the real estate department.

ORGANISATIONAL STRUCTURE

UNIVERSITY OF TWENTE ORGANISATION

Until 2018, University of Twente had a matrix organisation, in which research and education were independent organisational units and had an equivalent position (University of Twente, n.d.-b). From 2018, the organisational structure has been simplified, and the research institutes are no longer equivalent to the faculties (UT, n.d.-b). Research and education is provided by five faculties (UT, n.d.-b). As of 2018, the faculties are responsible for directing and steering research (UT, n.d.-b). In addition to the faculties and institution, the UT also has three multidisciplinary research institutes (UT, n.d.-b): MESA+, the TechMed Center, and the Digital Society Institute. The organogram of University of Twente is shown in Figure IV.1.

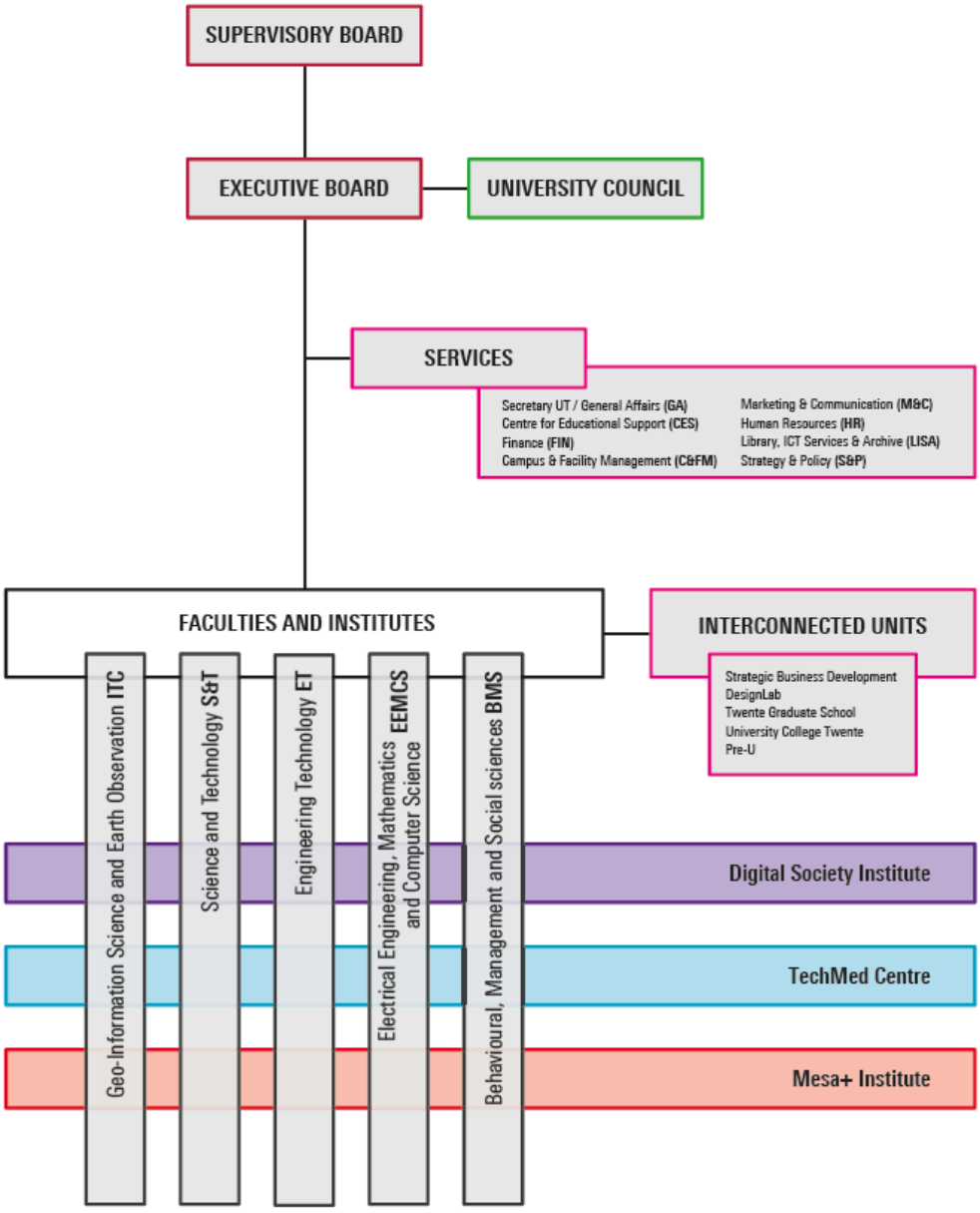


Figure IV.1– Organogram University of Twente (Universiteit Twente, 2019a)

The University of Twente also has eight support services (UT, n.d.-b): Secretary UT / General Affairs, Centre for Educational Support, Finance, Campus & Facility Management, Marketing & Communication, Human Resources, Library, ICT Services & Archive, and Strategy & Policy. The support service departments support education and research at the campus (UT, n.d.-b).

The organogram of the Campus & Facility Management (C&FM) department is illustrated in Figure IV.2. As shown in the organogram, the department C&FM provides all services related to the physical campus, including real estate management. The C&FM department is created in 2016 by merging the departments Facility Services, the unit Campus from the department General Affairs, and the unit Environment from the department Human Resources (vice-chair of the Executive Board in Kuipers, 2017; UT, n.d.-a). Before 2017, real estate management was provided by the Facility Services department (UT, personal communication, May 1, 2019). In 2016, real estate started to become an important factor within the university (UT, personal communication, May 1, 2019). The Executive Board realised that more cohesion between the different services related to the campus was necessary in order to use the campus optimally (vice-chair of the Executive Board in Kuipers, 2017). Thus, the reason for creating the C&FM department was to have an organisation in which direction and coordination of housing and campus development is well safeguarded (UT, n.d.-b).

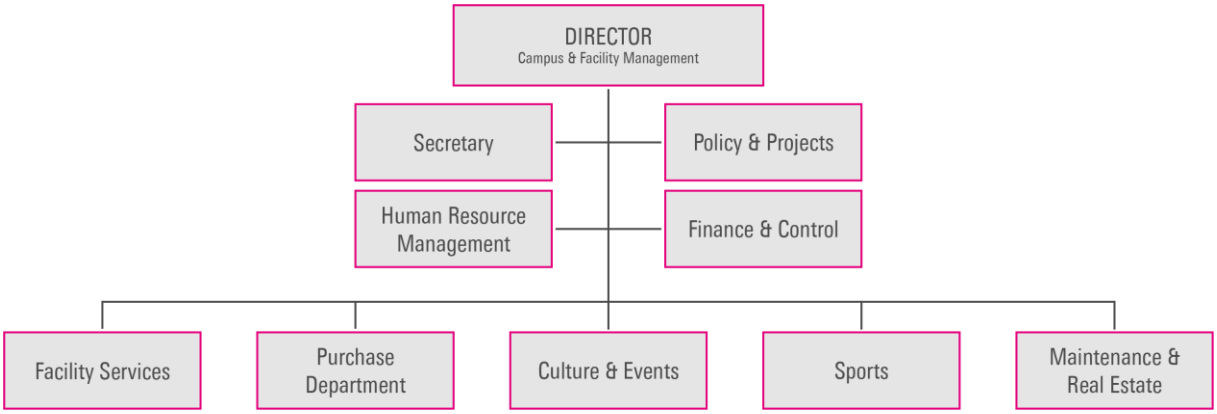


Figure IV.2 – Organogram Campus and Facility Management

UNIVERSITY OF TWENTE REAL ESTATE DEPARTMENT

In 2000, the University of Twente created a real estate unit, which was part of the Facility Services department (UT, personal communication, May 1, 2019). In 2016, a study was conducted into the organisational structure of a real estate department that optimally supports the real estate ambitions and one that better meets the demands of the Executive Board (UT, n.d.-d). The study was commissioned by the Executive Board, and conducted by an external party (UT, n.d.-d). The study used different scenarios in which different functions were either separated into different departments or joint together in one department (UT, n.d.-d). The different scenarios were presented to the Executive Board and the Executive Board decided on one of the scenarios (UT, n.d.-b). The chosen scenario included a new central services department – Campus & Facility Management – that consists of all campus related services, including the real estate department Maintenance & Real Estate (UT, personal communication, May 1, 2019).

Figure IV.3 shows the organisational structure of the Maintenance & Real Estate department. As shown in the organogram, the M&RE department consists of five departments, and is supported by a service desk. The different departments are elaborated on below, using gathered information from the interview (UT, personal communication, May 1, 2019).

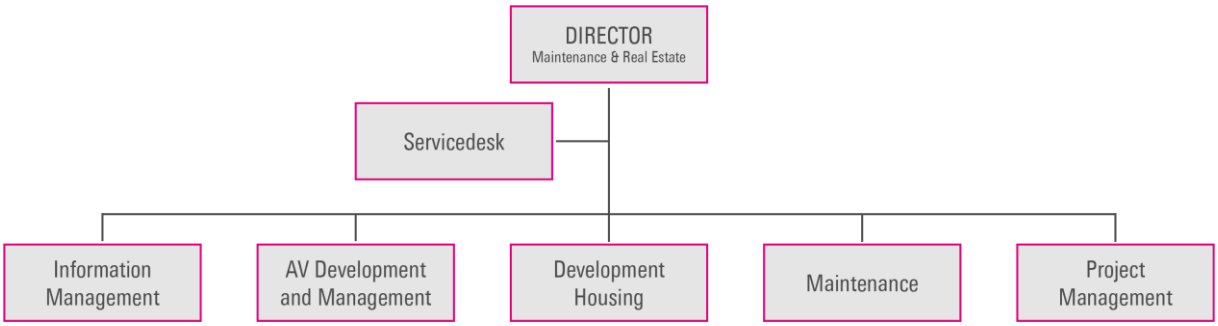


Figure IV.3 – Organogram Maintenance & Real Estate department (own illustration based on interview)

The C&FM department consists of five departments (UT, personal communication, May 1, 2019):

- Information Management
  The Information Management department is responsible for the information management of the real estate department. The department consists of a document manager and a financial administrator. The financial administrator is responsible for the internal costing of real estate.
- AV Development and Management
  AV Development and Management is responsible for all audio-visual tools on campus.
- Development Housing
  The Development Housing department consists of two employees: an energy coordinator and a portfolio manager real estate. The portfolio manager real estate is responsible for the real estate strategy.
- Maintenance
  The department Maintenance consists of contract managers, which are responsible for the contract management with external maintenance providers.
- Project Management
  Project Management consists of four project managers, of which one is an external service provider.

Furthermore, the Maintenance & Real Estate department is supported by a service desk. The Servicedesk is the central service desk of the university, and is located at the M&RE department as it has easy and short communication lines to the supporting services (UT, personal communication, May 1, 2019). The service desks of the faculties contact the central Servicedesk for problems, which are mainly related to maintenance or technical problems (UT, personal communication, May 1, 2019).

GROUPING OF DEPARTMENTS

The Maintenance & Real Estate department of WUR is part of the Campus & Facility Management department. In terms of grouping of departments, the C&FM department and M&RE department have a similar structure. As can be seen in the organograms in Figure IV.2 and IV.3, both department have grouped its department by functions. Thus, the M&RE department has a *functional* structure (see Figure IV.4). The different functions and departments of M&RE are discussed in the section above.

Figure II.4 – Facilities & Services department: functional grouping (Daft, Murphy & Willmot, 2010) edited

LEVEL OF CENTRALISATION

As illustrated in Figures IV.2 and IV.3, the University of Twente has a central real estate department – Maintenance & Real Estate – which is part of the Campus & Facility Management department. The faculties do not have a real estate department as part of their supporting services (UT, personal communication, May 1, 2019). The real estate department has a portfolio manager which communicates with the faculties regarding their real estate. However, this portfolio manager works for the M&RE department, which means that the faculties have no real estate decision-making authority (UT, personal communication, May 1, 2019). Thus, all real estate decision-making powers are located at the M&RE department. Therefore, UT has a *centralised* real estate decision-making process (see Figure IV.5)

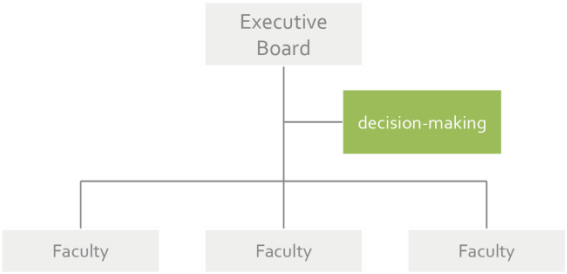


Figure IV.5 – Centralised decision-making authority (Bank & den Heijer, 2004) edited

Although real estate management is centralised within the university, the decision-making process is complex and consists of more layers than just the central real estate department. The decision-making process consists of three layers (UT, personal communication, May 1, 2019): a program team Real Estate, a steering committee Real Estate, and the Executive Board. The program team Real Estate consists of the real estate portfolio manager, the head of department M&RE, someone from the Finance department, someone from the Communication department, and someone from the Strategy & Policy department (UT, personal communication, May 1, 2019). The steering committee Real Estate consists of the director of all supporting services, the head of department M&RE, and the real estate portfolio holder of the Executive Board (UT, personal communication, May 1, 2019). The program team Real Estate is responsible for the preparation of the real estate policy (UT, personal communication, May 1, 2019). Once the policy is written, it is presented to the steering committee Real Estate, and the steering committee then decides on the policy (UT, personal communication, May 1, 2019). In case of larger and complex decisions, the steering committee presents it to the Executive Board, and the Executive Board ultimately decides on the policy (UT, personal communication, May 1, 2019).

LEVEL OF CONCENTRATION

University of Twente has a central real estate department at university level that is responsible for all real estate related issues. The faculties do not have a separate real estate department as part of their supporting services (UT, personal communication, May 1, 2019). The real estate portfolio manager operates as an account manager for the faculties, but his tasks are centrally regulated by the M&RE department (UT, personal communication, May 1, 2019). Therefore, UT has *concentrated* its real estate activities in a central place in the organisation (see Figure IV.6).

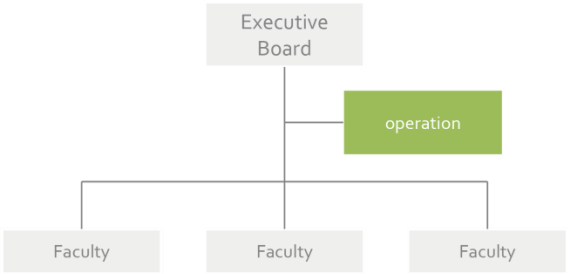


Figure IV.6 – Concentrated operation of real estate activities (Bank & den Heijer, 2004) edited

LEVEL OF SOURCING

The M&RE department outsources all its operational management activities (UT, personal communication, May 1, 2019). At the operational level, the real estate department only has contract managers (UT, personal communication, May 1, 2019). The contract managers are located at the department Maintenance (UT, personal communication, May 1, 2019). These contract managers are responsbile for managing the contracts with the external service providers (UT, personal communication, May 1, 2019). All strategical management activities and some tactical management activities are kept-inhouse, such as the design of the maintenance plans (UT, personal communication, May 1, 2019). Thus, Maintenance & Real Estate uses an *coordinating* model for sourcing its real estate activities (see Figure IV.7).

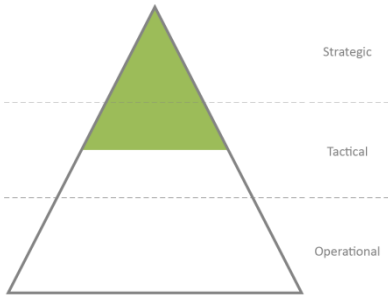


Figure IV.7 – Coordinating model (de Jong et al., 2013) edited

POSITION OF THE REAL ESTATE DEPARTMENT

The Maintenance & Real Estate department has little decision-making authority and needs approval from the Executive Board for larger financial decisions. The decision-making process consists of three layers (UT, personal communication, May 1, 2019): a program team Real Estate, a steering committee Real Estate, and the Executive Board. The program team Real Estate can be considered at the level of the real estate department; the program team is only responsible for the preparation of real estate policy and has no decision-making authority towards this policy (UT, personal communication, May 1, 2019). The steering committee Real Estate and the Executive Board are responsible for deciding on the real estate policy (UT, personal communication, May 1, 2019). The three layers of decision-making indicate that the M&RE department needs approval for most real estate decisions. Thus, the M&RE department has little decision-making powers. The little decision-making authority and the need for approval of the steering committee Real Estate and the Executive Board indicate a high position of the real estate department; close to the Executive Board (see Figure IV.8).

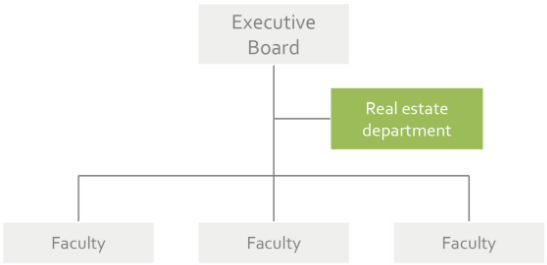


Figure IV.8 – High position of the real estate department: close to the Executive Board (Bank & den Heijer, 2004) edited

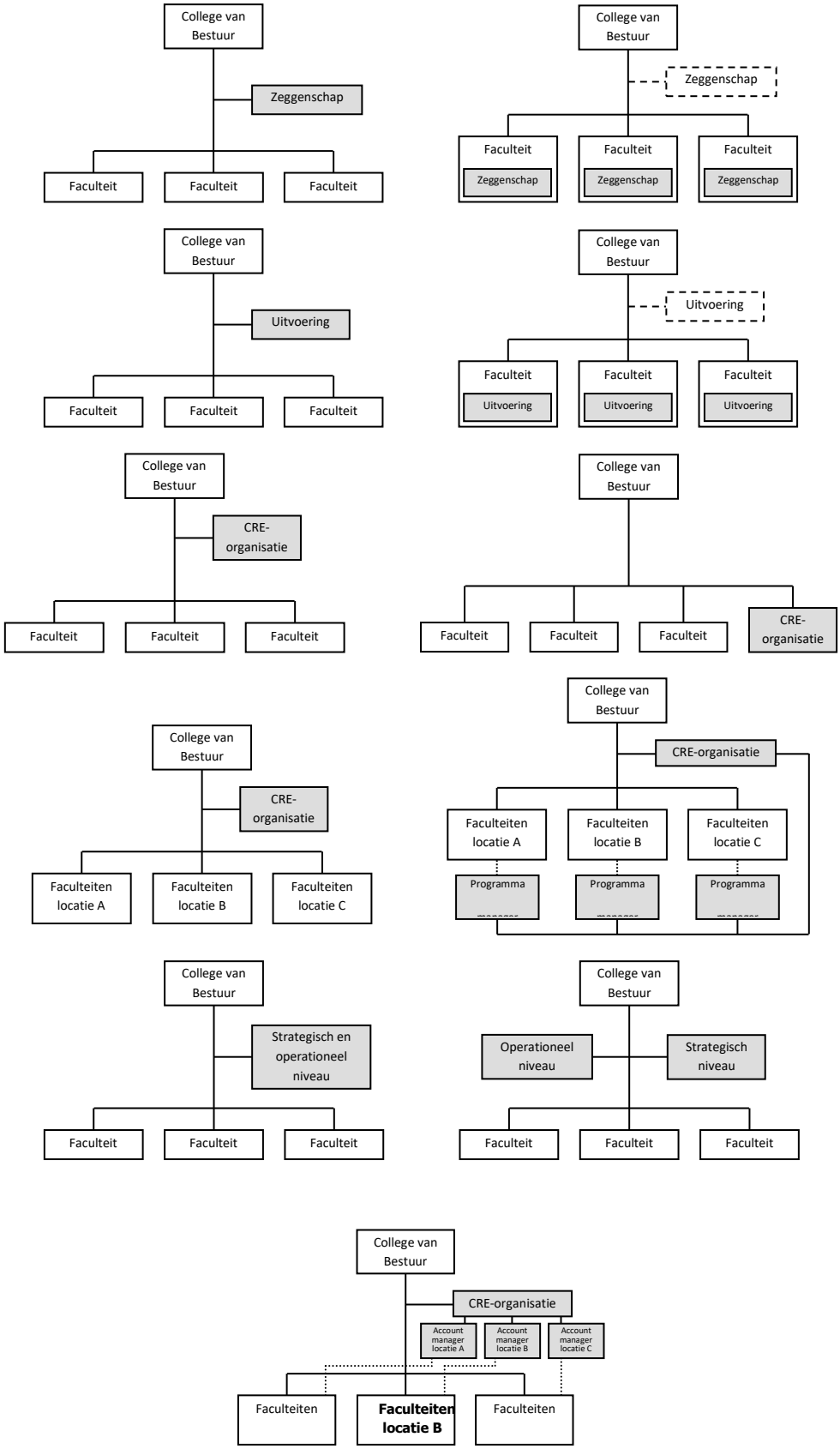
APPENDIX V
CURRENTLY AVAILABLE INFORMATION AND TOOLS

Van der Zwart (2014). Part of the *meta-model*: assessment of real estate perspectives

	strategic	functional	financial	physical
	aligning real estate with institutional goals	aligning real estate with (primary) processes	aligning real estate **financial** value, risks and costs with production of products and services	quantity and quality of current and future real estate
task manager	* supply in demand for real estate	* products and services can be suitably produced	* realization of real estate within budgets * historical costs * replacement costs	* technical focus * supply needs for real estate * engineering buildings
controller	* reducing real estate costs by optimising primary process	* physical environment optimal for primary process, analyses of primary processes are part of solution	* reducing real estate costs by optimising primary process * real estate costs / production rate	* cost reduction * analytical approach * information on RE objects * benchmark
dealmaker	* balancing real estate costs with optimising and increasing productivity of processes	* physical environment optimal for customer, analyses of customer satisfaction are part of solution	* balancing real estate costs against increasing producti - vity of processes * internal costing of real estate costs to sub processes	* create financial value * problem solving * standardisation real estate * flexible internal RE market
intrapreneur	* conscious insourcing and outsourcing	* optimising chain processes leads to real estate alterations	* balancing real estate costs against optimising and increasing production with chain partners * real estate market value	* internal RE company * proposing solutions * external market options
business strategist	* real estate adds value to organisational objectives	* international benchmark leads to changes in real estate with a state of the art working environment that adds to organisational objectives as goal.	* measuring and monitoring added value of real estate to organisational objectives	* anticipates on trends in society * measuring and monitoring results * contribute value to organisational objectives

Table 20 Assessment of real estate perspectives.

Bank & den Heijer (2004). zes keuzemogelijkheden organisatorische stuctuur



Wu (2015). Maturity model

Step 2 Assessment criteria

Criteria 1	Awareness clueless ↕ prepared	⊠ Awareness of the current condition and (mis)match ⊠ Awareness of changing demand and trends involved in the higher education sector
Criteria 2	Goal focus aimless ↕ high ambition	The level of goal focus expresses in the presence of plans and statements in improving a certain subject (e.g. enhancing competitiveness, reducing energy costs, increasing amount of amenities etc.) ⊠ Statements ⊠ Plans, strategies, visions
Criteria 3	Innovation level old fashioned ↕ innovational	Innovation drives up the competitive advantage, which means the level is determined by renewal of systems, tools, building materials and processes.
Criteria 4	Tools and systems underdeveloped ↕ advanced	⊠ The presence and maturity of research tools concerning a certain subject (e.g. monitor for energy usage). ⊠ Systems are related to the presence and maturity of documentation systems of information.
Criteria 5	Skills and expertise incompetent ↕ outstanding	The skills and expertise of the staff are an important factor which influences the maturity level of campus management. When people lack the skills to make links between disciplines, the true added value will be lost
Criteria 6	Communication poor ↕ excellent	⊠ Information share: The presence and maturity of information sharing systems; do they have a general system for information sharing, or does every party has its own framework. ⊠ The communication between stakeholders involved in the campus management. An example is that the facility management department regularly have meetings with the users of the building to determine their demand and satisfaction.

Step 2.1 Maturity levels strategic component

Level 1	⊠ No awareness of current supply and demand ⊠ Not aware of their competitors, nor they have intention to compete in the battle to become the best university ⊠ No research on future trends nor future changes such as student forecasts ⊠ There is no strategic, nor operational improvement focus ⊠ No research on innovation to add value on the buildings nor to increase competitive advantage; 'old-fashioned' ⊠ 'just letting it happen' attitude ⊠ Tools and systems to measure and document information are non-existing ⊠ Skills and expertise of staff are incompetent ⊠ Communication between stakeholders is poor ⊠ Information sharing systems are non-existing or very poorly
Level 2	⊠ Awareness of current supply and demand, but more importantly the mismatch ⊠ Awareness of their competitors, but no focus on competing. ⊠ There is a presence of statements related to goals, but not made concrete in plans yet ⊠ Innovation is not a driver yet, continuous operation has priority ⊠ Tools and systems are starting to developed; measure information to understand the current state ⊠ Skills and expertise of staff are related to their field only; no analytical skills ⊠ Communication between stakeholders is starting to developed to understand the basic needs of the users ⊠ Information sharing is developing because communication between stakeholders are better
Level 3	⊠ There is a strategic focus, which is made explicit in plans ⊠ Presence of a 'campus vision' to improve current supply based on current demand to ensure competitive advantage but also innovation ⊠ Tools and systems to measure the information is present (monitor for energy usage, monitor for user satisfaction) ⊠ The skills and expertise of staff are competent; they have the analytical skills to make connections between different information disciplines ⊠ Communication and information sharing between stakeholders is in a defined stage
Level 4	⊠ Awareness of future trends and changing demand, proactive in competing with the competitors, and they have the desire to stand out ⊠ Scenario planning, long term planning ⊠ Full implementation of plans or already on-going execution of plans ⊠ Innovational vision for their campus strategy ⊠ Attracting scientists & talents ⊠ Regularly having meetings to look forward and look back on happenings
Level 5	⊠ Generating future plans for continuous improvement ⊠ Strong strategic focus to compete and becoming the best university; desire to stand out ⊠ High ambitions ⊠ High level of innovation ⊠ High frequency of revising and adjusting the plans to match the changing needs ⊠ Advanced tools and systems which are being regularly checked ⊠ Outstanding skills and expertise of staff ⊠ Iconic buildings (not always the case) ⊠ Enhancing attractiveness buildings, facilities and public space ⊠ Enhancing the quality of infrastructure ⊠ Excellent communication and information sharing between stakeholders

Step 2.2 Maturity levels functional component

Level 1	No awareness of current state, and only focused on the required m² m² not for the right use No research on future trends nor future changes such as student forecasts No innovation in terms of space use Communication with users is poor
Level 2	Awareness of current supply and problems, they want to satisfy the basic technical needs of the users Satisfy basic space needs There is a presence of statements related to goals, but not made concrete in plans yet Standardizing space use Facilitating the amount of students in relation to the space, but not thinking about smart space use Communication with users is starting to develop, to understand the needs
Level 3	Plans to improve space usage Presence of research concerning the occupancy/ space or m² Clear view of space usage Research on innovational space use (flexible use, alternative space use) Communication and information sharing between stakeholders is in a defined stage
Level 4	They want to maximize output with and efficient use of m², they are aware of changing trends Implementation of flexible space use (multifunctional use, transformation, shared use) Student prognosis to forecast the amount of future enrolments Involve users, in order to determine their needs
Level 5	They have a clear image of what their space usage/ occupancy rate is Flexible functional space use, multifunctional use of space to maximize efficiency, generating new plans to anticipate on future trends Future plans to anticipate on changing working trends, and they know how this will affect the space usage (e-learning and flexible working) Excellent communication and information sharing between stakeholders

Step 2.3 Maturity levels financial component

Level 1	No awareness of current costs, and no financial plans to reduce costs, budget for required space No research on future trends nor future changes such as student forecasts Costs possibly exceeding benefits Tools and systems are underdeveloped, no clear view on what the actual income & costs are Information sharing is poor and ineffective, each party is using different framework; communication is passing along each other
Level 2	Awareness of current supply and problems= mismatch, budgeting plans, Minimizing building and operational costs There is a presence of statements related to goals, but not made concrete in plans yet Statements on having plans to use financial resources for creating added value for the university Tools and systems to measure the income & costs are human work, no systems yet
Level 3	Plans to improve current supply based on current demand, budget for improvement of competitive advantage (marketing), improving technical condition (energy label) Presence of a clear financial cost estimation on building and operational costs Investment planning Budget control Budget reserved for creating added value for the university Tools and systems are present. Information sharing is in a defined level between the stakeholders
Level 4	Awareness of future trends and changing demand, long-term financial planning (reducing footprint) Budget for new plans Presence of a financial department within the facility management department Allocating money for future plans (projects planned) Risk planning Tools and systems are advanced, and information is easy to communicate to other stakeholders
Level 5	Scenario and risk planning for future projects; anticipation on the changing future Cost estimation of future plans, also from scenario's Willingness to invest a larger amount of money in projects which create added value on the long-term High frequency of revising and adjusting the plans to match the changing needs Presence of information systems in which information is easy to share between stakeholders

Step 2.4a Maturity levels physical component (building level)

Level 1	The institution is not aware of the current technical state of the university and does not has goals for the future campus There is a presence of a technical controller, which controls the technical quality of the buildings and facilitates the demand of square meters No research on future trends nor future changes No research on innovation to add value on the buildings nor to increase competitive advantage; 'old-fashioned' corrective maintenance with only high intensity defects poor indoor climate minimum comply of sustainable development
Level 2	They are aware of the current technical state of the institution and the problems. They have plans to improve the technical state of the building. Awareness of what the technical buildings costs are, and try to minimize these costs by minimizing the square meters, but not so much on improving the technical state to reduce these costs. Meeting the basic needs of users (indoor climate) There is a presence of statements related to goals, but not made concrete in plans yet. Corrective maintenance Planning and initiating sustainable development
Level 3	The have explicit defined goals concerning the sustainable development of the campus, reducing the footprint. There is a presence of a 'campus vision' A monitor which measures and show the energy usage, the technical condition Presence of a maintenance programme Preventive maintenance Plans for sustainable development Plans to enhance the quality of the buildings and facilities
Level 4	They have a future prospect of developing the campus of the future, and are aware of this changing demand. Focus on sustainable development Using alternative innovative materials and products which will reduce the footprint Plans to dispose qualitative bad m2 in supply; plans for new construction Renewal building components (renovation) preventive maintenance using alternative materials and products implementation or on-going plans for enhancing the quality of buildings and facilities
Level 5	They have a strategy to encounter future changes in demand, and have alternative plans to meet this demand. Focus on creating added value such as reducing costs over the long run. Optimising and innovating; research on alternative and new materials on the market renewal building components tools and methods are advanced

Step 2.4b Maturity levels physical component (urban level)

Level 1	The institution is not aware of the current urban state of the university and does not has goals for the future campus. Not awareness of the added value of the location of the university Public space is not used to add value on the campus (no meeting space, or creating connections between buildings, no place to stay No amenities added to the campus; buildings are only of academic purpose Corrective maintenance on the public space occurs only with high intensity defects Minimum comply of sustainable development
Level 2	They are aware of the current state of the campus and the problems. They have plans to improve the public space, infrastructure, amenities. There is a presence of statements related to goals, but not made concrete in plans yet Meeting the basic needs of users (parking and roads) Corrective maintenance Planning and initiating sustainable development
Level 3	The have explicit defined goals concerning the sustainable development of the campus. There is a presence of a 'campus vision'. Presence of plans to improve the infrastructure (roads, parking, accessibility) Presence of a maintenance programme Preventive maintenance
	Plans for sustainable development Plans to enhance the quality of the public space
Level 4	They have a future prospect of developing the campus of the future, and are aware of this changing demand. Focus on sustainable development Preventive maintenance with using alternative sustainable materials and products which will last longer and needs lower maintenance. Renewal/renovation public space Enhancing accessibility of the university Enhance relation buildings and public space Proactive in sharing plans with the municipal parties that create added value on urban development level Implementation or on-going plans for enhancing the quality of public space
Level 5	They have a strategy to encounter future changes in demand, and have alternative plans to meet this demand. Scenario planning; e.g. an increase of people using the car will result in facilitating more cars Enhancing relation of campus with the city and the surroundings Optimising and innovating; research on alternative and new materials on the market Implementing new concepts for public space

Matser (2018). Analysis Framework