A strategic decision approach to ‘Office as a Service’

An explorative study into the optimization of the physical resource
in order to obtain maximum added value

T.N.J. (Thom) Schreurs I Master thesis I December 2019

“The greatest glory in living lies not in never falling,
but in rising every time we fall.”

Nelson Mandela

COLOPHON

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PREFACE

In front of lies the final master thesis “A strategic approach to ‘Office as a Service’: an explorative study into the optimization of the physical resource in order to obtain maximum added value.”, that symbolises the end of my educational period as a student. It is written within the graduation lab of Real Estate Management at the apartment of Management in the Built Environment, within the faculty of Architecture and the Built Environment at the Delft University of Technology (TU Delft).

This thesis is about the development of a strategic decision approach to ‘Office as a Service’ that can be of hand for organisations to decide which ‘Office as a Service’ strategy can help them to align their real estate to their core business in order to obtain maximum added value for their business and to contribute optimally to the overall performance of the organization. Which contributes to the overall objective of Corporate Real Estate Management.

By completing my graduation research, my time at the Delft University of Technology will come to an end. However, just like in corporate real estate the alignment between demand and supply has been a long-standing “problem”. In addition to the development process of the ‘strategic decision approach’, a process of personal development took place that can be characterized as a process of trial and error. But as mentioned by Nelson Mandela: “The greatest glory in living lies not in never failing, but in rising every time we fall”.

“The greatest glory in living lies not in never failing, but in rising every time we fail.”
Nelson Mandela

However, going through both processes was not possible without the help and support of people that were directly and indirectly involved. From the university I would like to thank my graduation mentors Alexandra Den Heijer and Marleen Hermans. I am forever grateful for all their time, energy, advice and especially their patience during this sometimes very difficult process. And not to forget, Monique Arkesteijn, who had a major positive influence on the process I have completed, were I am now and on what the future will look like.

Secondly, I would like to thank all the people at Colliers International in Rotterdam. For welcoming me with open arms and making me part of the organisation from day one. In particular Marjon van Bree, for giving me the opportunity and support to fight my own battle and having the confidence that I would overcome. And I want to thank Ruben Den Uyl, as a fellow graduate intern and future colleague, for bringing my chaotic thoughts together but above all for the experience of doing it together.

At last on a more personal level, I want to thank my family and friends. Who always believed in me and provided me with unconditional support and practical help along the way. Without the positive energy you gave me, I would not be able to do this.

I hope you enjoy reading this graduation report.

Thom Schreurs

Rotterdam, December 2019

MANAGEMENT SUMMARY

EXECUTIVE SUMMARY

A strategic decision approach to 'Office as a Service'

MSc Thesis
Thom Schreurs
December 2019

University: Delft University of Technology- MSc Architecture, Urbanism & Building Sciences
Mastertrack: Management in the Built Environment- Graduation laboratory: Real Estate Management
Mentors: Prof. Dr. Ir. A.C. (Alexandra) den Heijer, TU Delft & Prof. dr. ir. M.H. (Marleen) Hermans, TU Delft

Abstract

Problem statement: Organisations need real estate to enable them to perform their activities effectively and efficiently in a safe, protected and pleasurable environment. Typically, large organisations use many buildings to perform their activities. The relationship between a building (supply) and its users (demand) is constantly changing. This change is fuelled by technology and a host of economic and cultural trends. Because the supply-demand is changing continuously, most of the time there is a mismatch between what a building can offer and what an organisation requires. Therefore, one of the biggest challenges in Corporate Real Estate Management is reducing the gap between the high speed of business and the slow speed of real estate, i.e. between the so-called dynamic real estate demand and relatively static real estate supply.

Research objective: Based on the objective of Corporate Real Estate Management, the research objective of this graduation work is to develop and present knowledge of how the physical resource can be enhanced by implementing 'Office as a Service'. Because the mismatch is dynamic and will change frequently, a strategic decision approach to managing the mismatch between the user organisation and the building is proposed in order to offer a suitable way of approaching these problems. Therefore the main research question is: "How can 'Office as a Service' be a strategic decision approach for an organization to optimize their physical resources in order to obtain maximum added value?"

Research method: By conducting operational-empirical research, the research questions are answered. By means of operational research, a strategic decision approach is developed that can be used in the process of forming an accommodation strategy to align real estate to the needs of the core business. Empirical research was used to obtain input for the development of the operational model. This empirical research focused on the performance of 'Office as a Service' strategies in relation to both the presumed added values of real estate and the various typologies of occupier space demands. To obtain the required input, a method of a literature review, semi-structured interviews and a cross-case study was used.

Key findings and conclusion: A strategic decision approach is developed based on the concept of a Multi-Criteria Decision Analysis (MCDA) model. The development of this Multi-Criteria Decision Analysis model integrates the decision-makers criteria, which are based on the presumed added values of real estate as well as the five typologies of occupier space demand, with the alternative 'Office as a Service' strategies. Based on the model of Den Heijer (2011) to assess the added value of real estate decisions regarding the four stakeholder perspectives with their corresponding presumed added values, eight added values divided over all four stakeholder perspectives can be related to the concept of 'Office as a Service'. Next to the presumed added values of real estate which contribute to the strategic goals of an organization, an operational aspect is added to the decision-criteria taking into account five typologies of occupier space demand of an organisation. Based on the Core-Periphery operational real estate portfolio space model of Gibson and Lizieri (1999) in relation to the alternative 'Office as a Service' strategies this results in the following interpretation: a stepped ascending relationship where the increase of flexibility is answered by a more external 'Office as a Service' strategy.

Keywords: Corporate Real Estate Management, Strategic decision approach, Office as a Service, Added value

1. RESEARCH PROPOSAL

INTRODUCTION

Organisations need real estate to enable them to perform their activities effectively and efficiently in a safe, protected and pleasurable environment. Typically, large organisations use many buildings to perform their activities. The alignment of their real estate strategy with organisational strategy and/or user needs is however a long-standing problem (Heywood & Arkesteijn, 2017).

Changing demand

This long-standing problem is fuelled by the changing way of working. Today, work is fundamentally different than it was 20, 10 or even 5 years ago. And the pace of change, fuelled by technology and a host of economic and cultural trends, is accelerating faster than ever before.

Changing supply

Just as trends influence the demand for office space, there are also drivers and trends that influence the supply of space. This graduation research takes a look into the twin trend of 'servitization' and the 'sharing economy' that are also affecting the world of real estate and the world of work. As a result of this, a new theme has emerged: 'Office as a Service'.

PROBLEM ANALYSIS

Responding to the emerging trends in technology, economy and society, the change of demand/user needs becomes larger and more unpredictable. With real estate as relatively static, this results in a more frequent and bigger mismatch between the current demand and supply of an organisation. The question that follows is what to do with this long-standing problem of the alignment between the real estate strategy with organizational strategy and or user needs? As a reaction to this more changing and more unpredictable demand the real estate market responded by offering flexible serviced office space: 'Office as a Service'.

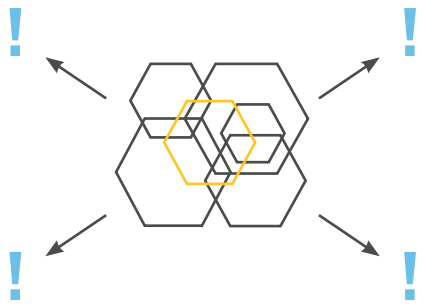
PROBLEM DEFINITION

Because the supply- demand is changing continuously, most of the time there is a mismatch between what a building can offer and what an organisation requires. Therefore one of the biggest challenges in Corporate Real Estate Management is reducing the gap between the high speed of business and the slow speed of real estate, i.e. between the so-called dynamic real estate demand and relatively static real estate supply.

Figure I: *Problem definition*

RESEARCH OBJECTIVE

Based on the objective of Corporate Real Estate Management, the problem analysis and problem statement the research objective of this graduation research is originated. Therefore, the research objective of this graduation work is to develop and present knowledge of how the physical resource can be enhanced by implementing 'Office as a Service'. Because the mismatch is dynamic and will change frequently, a strategic decision approach to managing the mismatch between the user organisation and the building is proposed in order to offer a way of approach these problems.



A strategic decision approach for 'Office as a Service'

Figure II: *Research objective*

RESEARCH QUESTION

Based on the problem definition and research objective, the main research question is: How can 'Office as a Service'' be a strategic decision approach for an organisation to optimize their physical resources in order to obtain maximum added value?

CONCEPTUAL MODEL

The conceptual model is based on the main terms and concepts that are used in the main research question. In this main research question, six terms can be distinguished that can be put into a triangle that shows the relationship between them.

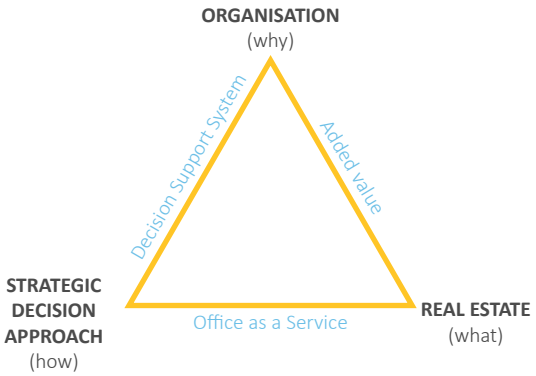


Figure III: *Conceptual model*

SCOPE DEFINITION

This research has the objective to develop and present knowledge on how the physical resource can be enhanced by implementing 'Office as a Service'. This research builds upon multiple bodies of knowledge linked to the conceptual model: Real Estate Management, Decision Support Systems and 'Office as a Service'. Together with the organisation perspective they can be presented in a Venn diagram.

Figure IV: *Scope definition*

The organizational perspective will make use of the perspective of the user/supplier of an 'Office as a Service' strategy. An occupier organisation who implements an 'Office as a Service' strategy within their own portfolio and can be both supplier and user implementation.

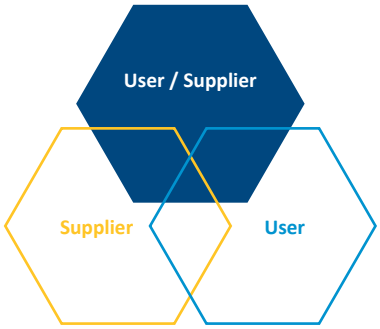


Figure V: *Organizational perspective*

2. METHODOLOGY

RESEARCH DESIGN

The research is conducted as a hybrid research combining operational and empirical research elements. In order to answer the main research question several research 'steps' are needed. The approach of this research consists of nine more or less consecutive steps, within three iterative loops. Figure VI shows the research design and is based on the design research cycles of Hevner and Chatterjee (2010)

The nine steps undertaken for this research are:

- Step 1: Determination of the context;
- Step 2: Problem definition and research objective;
- Step 3: Literate study;
- Step 4: Conceptual design of the 'strategic decision approach';
- Step 5: Interviews;
- Step 6: Preliminary design of the 'strategic decision approach';
- Step 7: Verification and validation of the preliminary decision approach;
- Step 8: Detailed design of the 'strategic decision approach';
- Step 9: Conclusions, discussion and recommendations for further research;

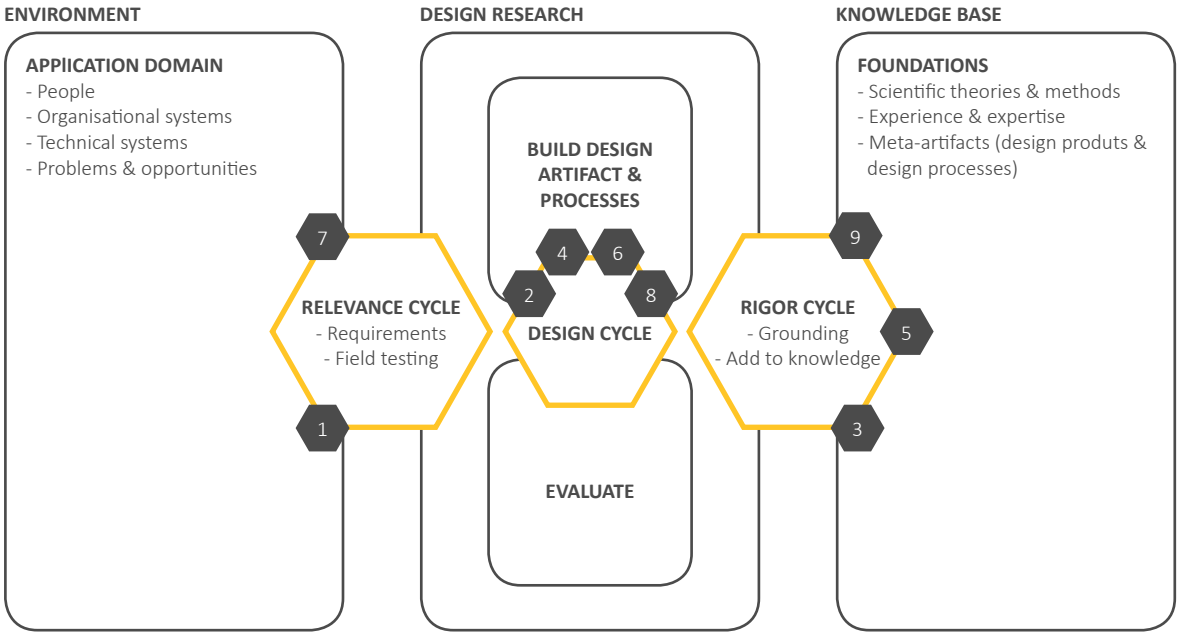


Figure VI: Research design

3. LITERATURE STUDY

A literature research (step 3) was conducted in order build an overview of the existing theories and existing knowledge related to the three bodies of knowledge : Real Estate Management, Decision Support Systems and 'Office as a Service'.

REAL ESTATE MANAGEMENT

The basis of real estate management is the presumed added value of real estate on performance, either negative or positive (Den Heijer, 2011). Referred to as the fifth resource for an organisation (De Jonge, 1996; Joroff, Lambert, & Louargand, 1993; Krumm, 1999), real estate has thirteen objectives through which the physical resources can add value to the organisation (Valks, Arkesteijn, Den Heijer, 2018). Based on the Corporate Real Estate Management model, these thirteen presumed added values can be divided over the four perspectives of stakeholders which all serve different performance criteria.

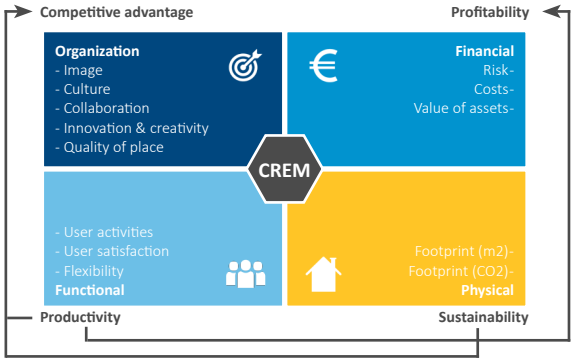


Figure VII: Real Estate Management

DECISION SUPPORT SYSTEMS

Decision-making in the field of (corporate) real estate management requires multiple objectives. They are often conflicting and come from stakeholders driven by various goals. For this reason, the concept of Multi-Criteria Decision Analysis is introduced to support the decision-making process by taking explicit account of multiple criteria to make the most suitable decision. With this approach, the alternatives are assessed against the defined criteria to choose the most suitable. They make use of weights and preferences to come to the optimal solution.

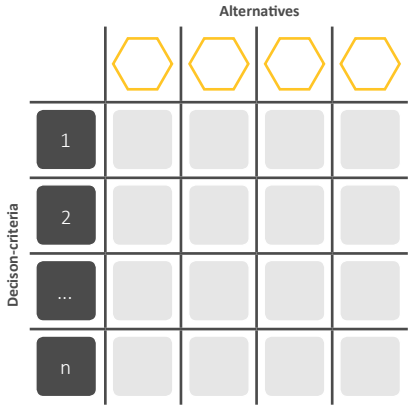


Figure VIII: Decision Support Systems

'OFFICE AS A SERVICE'

'Office as a Service' is based on the underlaying theories of servitization and product-service-systems. A serviced office is defined as space within a building that is let, sub-let or licensed to third parties on a serviced basis. The services comprise all of the building services and a menu of business support services. 'Office as a Service' can be analysed in line with the management levels of Joroff et al. (1993): strategic, tactical and operational. This includes four alternative strategies, three tactical solutions and three groups of variables out of which a Product-Service-System is built upon: product variables, services variables and general variables.

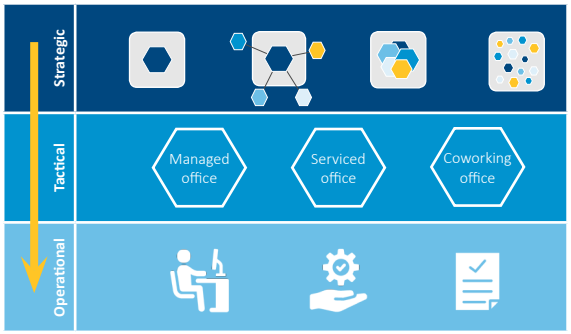


Figure IX: 'Office as a Service'

4. CONCEPTUAL DESIGN

The development of the conceptual design of the 'strategic decision approach' (step 4) is the result of the integration of the established specifications that emerged from the literature study (step 3) related to the following bodies of knowledge: Real Estate Management, Decision Support Systems and 'Office as a Service'. According to the second phase of a Multi-Criteria Decision Analysis process, this focussed on 'model building' and 'model use'.

Model building

To build the 'strategic decision approach' the formal procedure of a MCDA is used:

- *Specification of alternatives:* The alternatives that are taken into account are based on the established specifications of 'Office as a Service' concerning the four 'Office as a Service' strategies as well as the three 'Office as a Service' solutions.
- *Defining the decision-makers criteria:* The decision-makers criteria that are taken into account are based on the established specifications of Real Estate Management concerning the four stakeholder perspectives with their related presumed added values.
- *Rating the decision-maker preference for each alternative in relation to each criterion:* Rating the alternatives on the decision-maker criteria will take place in step 5 of the research design.
- *Assigning the decision-maker weight to each criterion:* Related to the decision-makers criteria, each stakeholder perspective can give their preference. Next to that each stakeholder perspective can be given a decision-weight in the decision process.

Model use

The use of the 'strategic decision approach' is related to the third step of the 'Designing an Accommodation Strategy' framework: Weigh and select alternatives (to create future real estate supply for the organization). Translating this step into the use of the 'strategic decision approach' the following steps need to be taken:

- *Determine future demand:* The future demand is determined by having the four stakeholder perspectives determine their preferences/ objectives in combination with a given decision-weight per stakeholder perspective.
- *Design alternatives:* The alternatives are already designed and are based on the established specifications of 'Office as a Service' concerning the four 'Office as a Service' strategies as well as the three 'Office as a Service' solutions.
- *Weigh and select alternatives:* Rating the alternatives on the decision-maker criteria will take place in step 5 of the research design.
- *Determine future supply:* Based on the chosen objectives with corresponding decision-weight per stakeholder perspective, a total score can be calculated per alternative to determine the optimal solution.

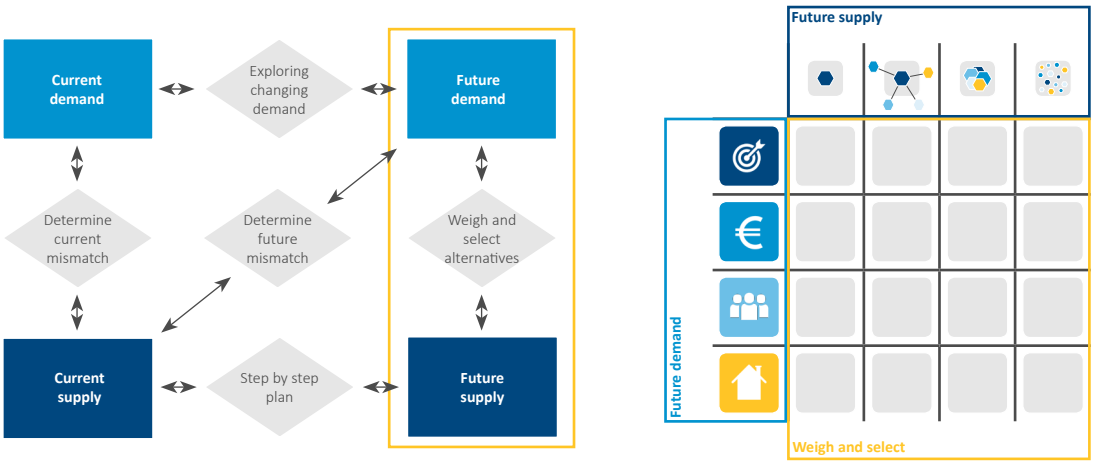


Figure X: Conceptual design

5. PRELIMINARY DESIGN

The development of the preliminary design of the 'strategic decision approach' (step 6) is the result of the integration of data derived out of the interviews (step 5) with the conceptual design (step 4). The goal of the interview process was to verify, supplement and refine the conceptual design which was based on literature research (step 3). The data derived from the interviews was categorized according to the defined decision-makers criteria (why), the specification of alternatives (what) and the relationship between them (why-what).

WHY

Added value

Out of the first thirteen presumed added values that are taken into account as an input for the conceptual design, eight added values can be related to the concept of 'Office as a Service'. These eight added values, with their corresponding Key Performance Indicators, are included in the development of the preliminary design. The remaining five added values are, although not related to 'Office as a Service', not yet removed out of the design of the 'strategic decision approach'. This is because these added values may still be mentioned in the next research step and are still useful for the development of the 'strategic decision approach'.

	Supporting image	Intern > extern
	Supporting culture	Intern > extern
	Stimulating collaboration	Variety of user groups
	Stimulating innovation	Unplanned > planned encouters
	Improving quality of place	
€	Controlling risk	Outsourcing
	Decreasing costs	cost per desk
	Increasing value of assets	
	Supporting user activities	
	Increasing user satisfaction	
	Increasing flexibility	> contract duration
	Reducing footprint (m2)	square meters / desk
	Reducing footprint (CO2)	

Figure XI: *analysis added value*

Occupier space demand

Although the conceptual design of the strategic decision approach takes into account the added value which contributes to the strategic goals of an organisation, the operational space utilization to optimize the supply-demand relationship is not taken into account. Applying the core/non-core concept to the corporate real estate portfolio, Gibson and Lizieri (1999) developed the Core-Periphery operational real estate portfolio space model.

Therefore, alongside the added values, five typologies of occupier space demand are added to the decision-makers criteria:

- Migratory in;
- Migratory out;
- Flexible occupy;
- Transitory headcount;
- Constant headcount;

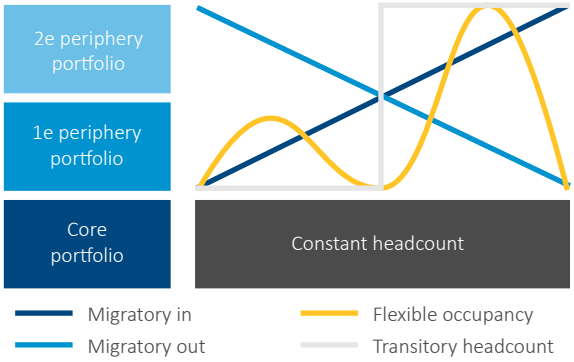


Figure XII: *analysis occupier space demand*

WHAT

Based on the alternatives that are taken into account as an input for the conceptual design, the three tactical solutions of 'managed office', 'serviced office' and 'coworking office' are evaluated. Arsing from this evaluation in relation to the development of the preliminary design, the choice has been made to focus on the strategic alternatives and to keep the tactical alternatives as a recommendation for future research.

WHY-WHAT

Based on the eight related added values with their corresponding KPI and the five occupier space demand typologies, the four 'Office as a Service' strategies are rated against each other from 1 to 4. In which 1 is the preferred option in relation to the decision-criteria.

6. DETAILED DESIGN

The development of the detailed design of the 'strategic decision approach' (step 8) is the result of the integration of the data derived out of the case studies (step 7) with the preliminary design (step 6). The goal of the case study research was to verify, supplement and refine the preliminary design which was based on literature research (step 3) and an interview process (step 5).

IN-CASE ANALYSIS

The aim of the in-case analyses was gaining data regarding their intended demand, both on added values and on occupier space demand, their chosen 'Office as a Service' strategy in relationship to the Core-Periphery model of Gibson and Lizieri (1999) and finally the relationship between their demand and supply.

The three case studies that have been used to gather this data were: ING with the development of their new international headquarters in the Bijlmerdreef in the southeast of Amsterdam, Microsoft with the renovation of their office at Schiphol and Uber with their new office close to Amsterdam Amstel.

CROSS-CASE ANALYSIS

A cross-case analysis was made in order to learn from the conducted case studies. With this cross-case analysis, the data derived from the case studies was categorized according to the defined decision-makers criteria (why), the specification of alternatives (what) and the relation between them (why-what). Hereafter a pattern matching technique is used to identify similarities and differences.

The cross-case analysis showed:

- That out of the thirteen presumed added values of real estate, nine added values are mentioned as an objective in which the accommodation strategy must contribute. ING and Microsoft focussed on the left side of the CREM model, focused on the institution. While Uber focussed on the right side, focused on real estate.
- That based on the occupier space demand typologies, this results in the following interpretation between the Core-Periphery model of Gibson and Lizieri (1999) and the alternative 'Office as a Service' strategies: a stepped ascending relationship where the increase of flexibility is answered by a more external strategy of 'Office as a Service'.
- Based on the cross-case analysis (why-what) the following conclusions can be drawn: First, the cross-case analysis (why-what) substantiates the conclusion of the cross-case analysis 'what' that the increase of flexibility is answered by a more external strategy of 'Office as a Service'. Because both added values 'controlling risk' and 'increasing flexibility' are related to an external 'Office as a Service' strategy. And second, the added values from the organizational perspective are more related to an internal 'Office as a Service' strategy.

DEVELOPMENT DETAILED DESIGN

For the development of the detailed design, the empirical findings derived from the case studies were confronted with the preliminary design of the strategic decision approach. This resulted in a detailed design of the 'strategic decision approach' that takes into account eight added values, divided over all four stakeholders perspectives and five occupier space demand typologies where the increase of flexibility is answered by more external 'Office as a Service' strategy.

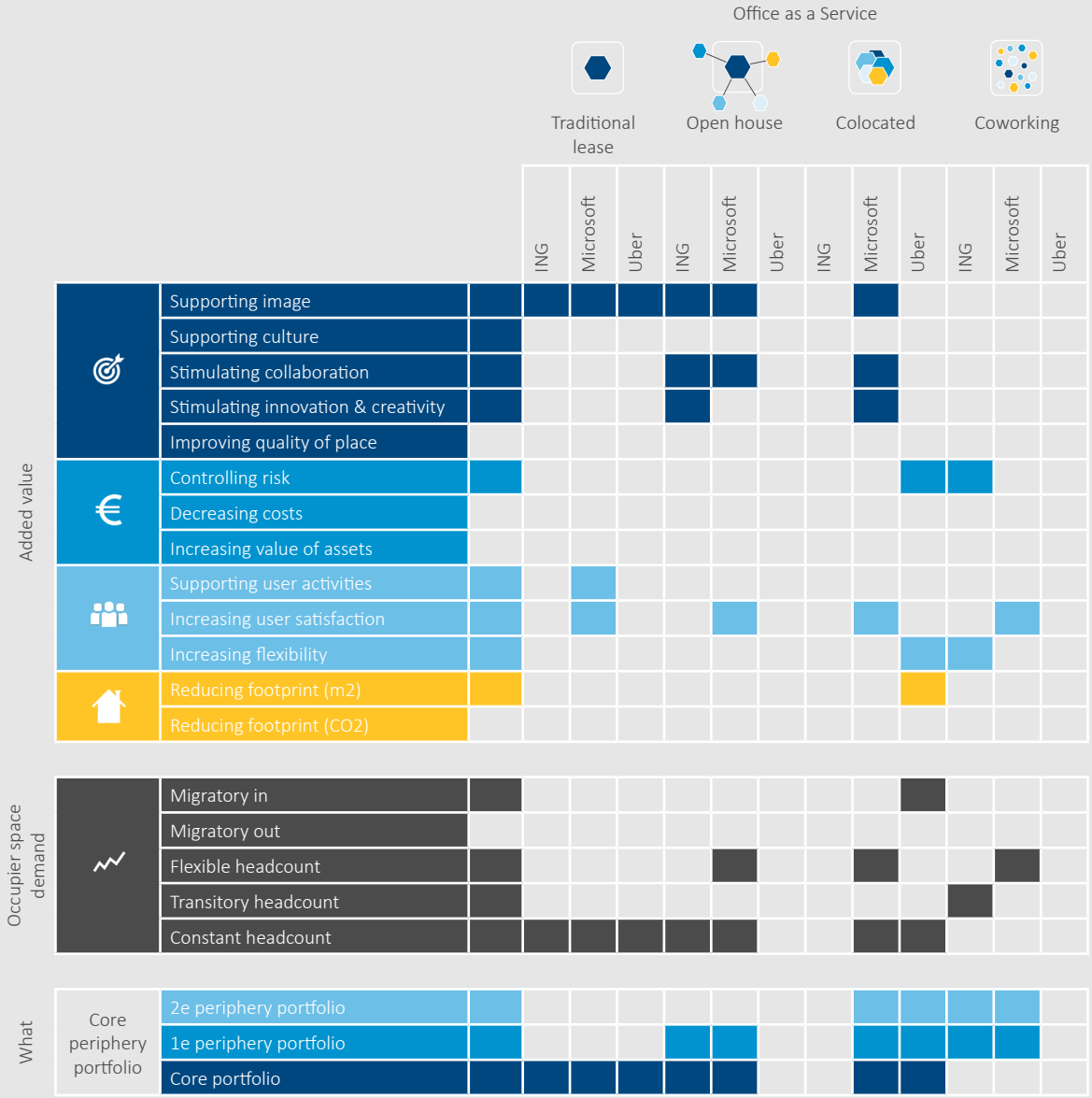


Figure XIII: Cross-case analysis

7. CONCLUSION

The integration of the theoretical input out of the literature study of step 3 and the data collection and analysis derived out of step 4 up to and including step 8 will be used to deliver the insights for answering the main research question and come to conclusions.

In order to answer the main research question: “How can ‘Office as a Service’ be a strategic decision approach for an organisation to optimize their physical resources in order to obtain maximum added value”, a strategic decision approach is developed based on the concept of a Multi-Criteria Decision Analysis (MCDA) model.

The development of this Multi-Criteria Decision Analysis model integrates the decision-makers criteria, which are based on the presumed added values of real estate as well as the five typologies of occupier space demand, with the alternative ‘Office as a Service’ strategies.

Added values

Based on the model of Den Heijer (2011) to assess the added value of real estate decisions regarding the four stakeholder perspectives with their corresponding presumed added values, eight added values divided over all four stakeholder perspectives can be related to the concept of ‘Office as a Service’.

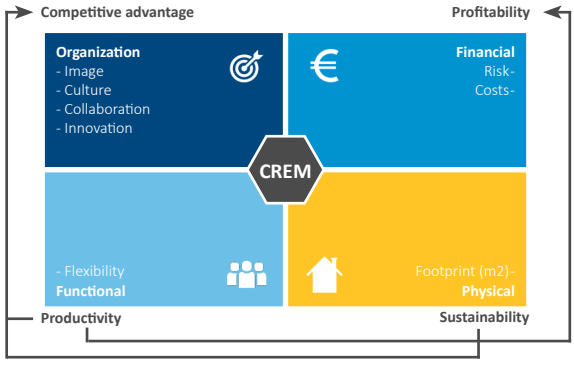


Figure XIV: Added value ‘Office as a Service’

Occupier space demand

Next to the presumed added values of real estate which contribute to the strategic goals of an organization, an operational aspect is added to the decision-criteria taking into account five typologies of occupier space demand of an organisation. Based on the Core-Periphery model of Gibson and Lizieri (1999) in relation to the alternative ‘Office as a Service’ strategies this results in the following interpretation: a stepped ascending relationship where the increase of flexibility is answered by a more external ‘Office as a Service’ strategy.

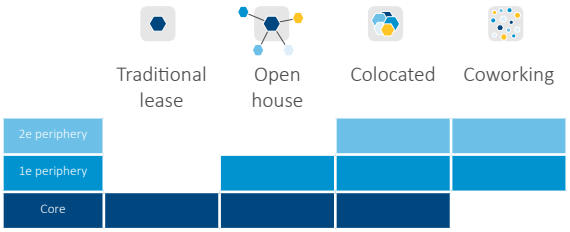


Figure XV: Core-Periphery vs ‘Office as a Service’

The integration of both groups of decision-makers criteria leads to the following result: A strategic decision approach to ‘Office as a Service’ that can be used by organizations to optimize their physical resources in order to obtain maximum added value. The strategic decision approach to ‘Office as a Service’ is depicted in figure XVI.

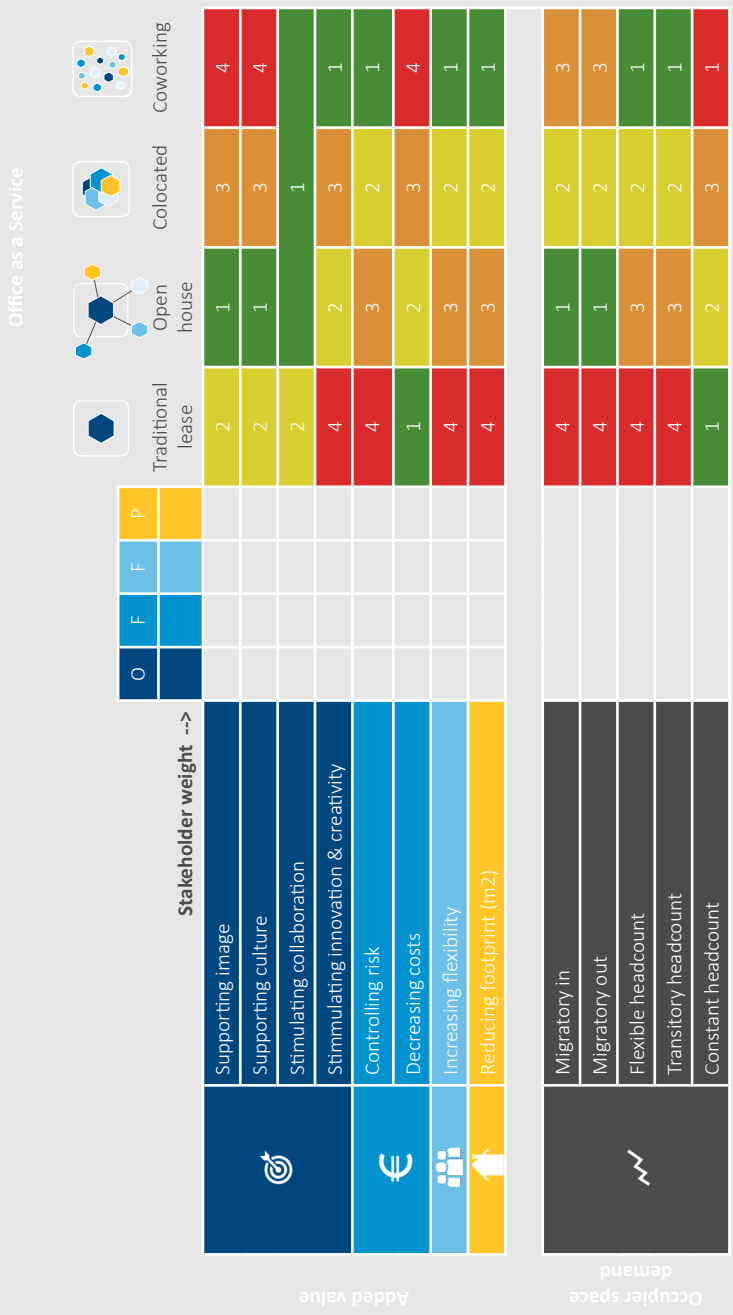


Figure XVI: Strategic decision approach 'Office as a Service'

MANAGEMENT SAMENVATTING

Een strategisch beslismodel voor 'Office as a Service'

MSc Thesis
Thom Schreurs
December 2019

Universiteit: Technische Universiteit Delft - MSc Architecture, Urbanism & Building Sciences
Mastertrack: Management in the Built Environment- Graduation laboratory: Real Estate Management
Mentoren: Prof. Dr. Ir. A.C. (Alexandra) den Heijer, TU Delft & Prof. dr. ir. M.H. (Marleen) Hermans, TU Delft

Abstract

Probleemstelling: Organisaties hebben vastgoed nodig om hun activiteiten effectief en efficiënt uit te kunnen voeren in een veilige, beschermde en plezierige omgeving. Doorgaans gebruiken grote organisaties meerdere gebouwen om hun activiteiten uit te voeren. De relatie tussen een gebouw (aanbod) en zijn gebruikers (vraag) veranderd echter voortdurend. Dit wordt onder meer veroorzaakt door de ontwikkeling van technologie en tal van economische en culture trends. Doordat de vraag naar aanbod voortdurend verandert, is er meestal een mismatch tussen wat een gebouw kan bieden en wat een organisatie nodig heeft. Daarom is een van de grootste uitdagingen in Corporate Real Estate Management het verkleinen van de kloof tussen de snelheid van een bedrijf en de traagheid van vastgoed, dat wil zeggen tussen de zogenaamde dynamische vastgoedvraag en het relatief statische vastgoedaanbod.

Onderzoeksdoelstelling: Gebaseerd op de doelstelling van Corporate Real Estate Management, is het onderzoeksdoel van dit afstudeeronderzoek het ontwikkelen en presenteren van kennis over hoe vastgoed kan worden verbeterd door het implementeren van 'Office as a Service'. Omdat de mismatch dynamisch is en regelmatig verandert, wordt een strategisch beslismodel voorgesteld om een manier te bieden om de mismatch tussen de gebruiker en het vastgoed op te lossen. Daarom is de hoofdvraag van dit onderzoek: "Hoe kan 'Office as a Service' een strategisch beslismodel zijn voor een organisatie om hun vastgoed te optimaliseren om daarmee maximale toegevoegde waarde te verkrijgen?"

Onderzoeksmethode: Door middel van een operationeel-empirisch onderzoek worden de onderzoeksvragen beantwoord. Met behulp van een operationeel onderzoek wordt een strategische beslismodel ontwikkeld die kan worden gebruikt bij het vormen van een huisvestingsstrategie. Empirisch onderzoek wordt gebruikt voor het verkrijgen van de juist input voor het maken van het operationele model. Dit empirisch onderzoek richt zich op de prestaties van 'Office as a Service'-strategieën in relatie tot zowel de toegevoegde waarde van vastgoed als wel de typologieën van gebruikersbehoefte van ruimte. Om de vereiste input te verkrijgen werd een methode van semigestructureerde interviews en een cross-case studie gebruikt.

Bevindingen en conclusie: Een strategisch beslismodel is ontwikkeld op basis van het concept van een Multi-Criteria Decison Analysis (MCDA) model. Het ontwikkelde Multi-Criteria Decision Analysis model integreert de besliscriteria, die gebaseerd zijn op de toegevoegde waarde van vastgoed en de vijf typologieën van gebruikersbehoefte van ruimte, met de alternatieve 'Office as a Service' strategieën. Op basis van het model van Den Heijer (2011) om de toegevoegde waarde van vastgoedbeslissing te beoordelen met betrekking tot de vier stakeholder perspectieven en hun bijbehorende veronderstelde toegevoegde waarden, kunnen acht toegevoegde waarden, verdeeld over alle vier de stakeholder perspectieven, worden gerelateerd aan het concept van 'Office as a Service. Naast de strategische doelen van een organisatie, is er een operationeel aspect toegevoegd met betrekking tot de vijf typologieën van gebruikersbehoefte van ruimte op basis van het Core-Periphery model van Gibson en Lizieri (1999). In relatie tot de alternatieve 'Office as a Service' strategieën resulteert dit in de volgende interpretatie: een stapsgewijze stijgende relatie waar de vraag naar toenemende flexibiliteit wordt beantwoord door een meer externe 'Office as a Service' strategie

Trefwoorden: Vastgoed management, Strategisch beslismodel, Office as a Service, Toegevoegde waarde

1. ONDERZOEKSVOORSTEL

INTRODUCTIE

Organisaties hebben vastgoed nodig om hun activiteiten effectief en efficiënt uit te kunnen voeren in een veilige, beschermde en plezierige omgeving. Doorgaans gebruiken grote organisaties meerdere gebouwen om hun activiteiten uit te voeren. De afstemming van hun vastgoedstrategie op hun organisatiestrategie en/of gebruikersbehoefte is echter al lang een probleem (Heywood & Arkesteijn, 2017).

Veranderende vraag

Dit langdurige probleem wordt gevoed door de veranderende manier van werken. Tegenwoordig is het werk fundamenteel anders dan 20, 10 of zelfs 5 jaar geleden. En het tempo van verandering, aangewakkerd door technologie en tal van economische en culturele trends, versnelt sneller dan ooit.

Veranderend aanbod

Net zoals trends de vraag naar kantoorruimte beïnvloeden, zijn er ook drivers en trends die het aanbod van ruimte beïnvloeden. Dit afstudeeronderzoek onderzoekt de gezamenlijk trend van 'servitization' en 'sharing economy' die ook de wereld van het vastgoed en de manier van werken beïnvloeden. Als gevolg hiervan is een nieuw thema naar voren gekomen: 'Office as a Service'.

PROBLEEM ANALYSE

Als reactie op de opkomende trends en ontwikkelingen in technologie, economie en maatschappij wordt de verandering van de vraag en/of gebruikersbehoefte groter en onvoorspelbaarder. Met vastgoed als relatief statisch, resulteert dit in een frequentere en grotere mismatch tussen de huidige vraag en het aanbod van een organisatie. Vraag is wat te doen met dit al lang bestaande probleem van de afstemming tussen de vastgoedstrategie met de organisatiestrategie en/of gebruikersbehoeften? Als reactie op deze veranderende en meer onvoorspelbare vraag reageerde de vastgoedmarkt door middel van het aanbieden van flexibele kantoorruimte: 'Office as a Service'.

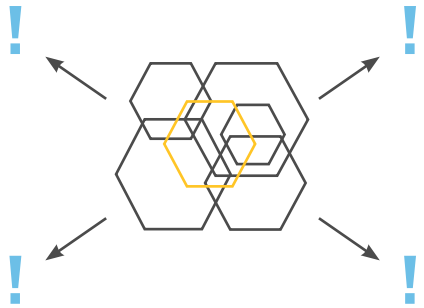
PROBLEEM DEFINITIE

Om de vraag naar aanbod voortdurend verandert is er meestal een mismatch tussen wat een gebouw kan bieden en wat een organisatie nodig heeft. Daarom is een van de grootste uitdagingen in Corporate Real Estate Management het verkleinen van de kloof tussen de hoge bedrijfssnelheid en de trage snelheid van vastgoed, dat wil zeggen tussen de zogenaamde dynamische vastgoedvraag en het relatief statische vastgoedaanbod.

Figure XVII: *Probleem definitie*

ONDERZOEKSDOELSTELLING

Op basis van de doelstelling van Corporate Real Estate Management, de probleem analyse en de probleemstelling is de onderzoeksdoelstelling van dit afstudeeronderzoek ontstaan. Dit resulteert in de volgende onderzoeksdoelstelling: het ontwikkelen en presenteren van kennis over hoe vastgoed kan worden verbeterd door het implementeren van 'Office as a Service'. Omdat de mismatch dynamisch is en regelmatig verandert, wordt een strategisch beslismodel voorgesteld om een manier te bieden om de mismatch tussen de gebruiker en het vastgoed op te lossen.



A strategic decision approach for 'Office as a Service'

Figure XVIII: *Onderzoeksdoelstelling*

ONDERZOEKSVRAAG

Op basis van de probleemdefinitie en de onderzoeksdoelstelling is de hoofdvraag: “Hoe kan ‘Office as a Service’ een strategisch beslismodel zijn voor een organisatie om hun vastgoed te optimaliseren om maximale toegevoegde waarde te verkrijgen?”

CONCEPTUEEL MODEL

Het conceptuele model is gevormd op basis van de belangrijkste termen en concepten die worden gebruikt in de hoofdonderzoeksvraag. In deze hoofdonderzoeksvraag kunnen zes termen worden onderscheiden die in een driehoek kunnen worden geplaatst die de relatie laat zien tussen de zes.

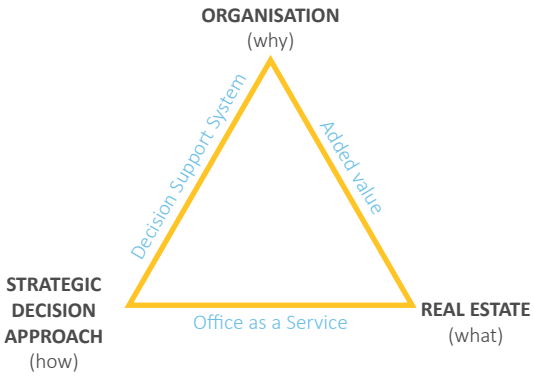


Figure XIX: *Conceptueel model*

SCOPE DEFINITIE

Dit onderzoek heeft als doelstelling kennis te ontwikkelen en te presenteren over hoe vastgoed kan worden verbeterd door het implementeren van ‘Office as a Service’. Dit onderzoek bouwt voort op meerdere hoofdonderwerpen die aan het conceptueel model zijn gekoppeld: Vastgoed management, Beslismodellen en ‘Office as a Service’. Samen met het organisatieperspectief kunnen ze worden gepresenteerd in een Venndiagram.

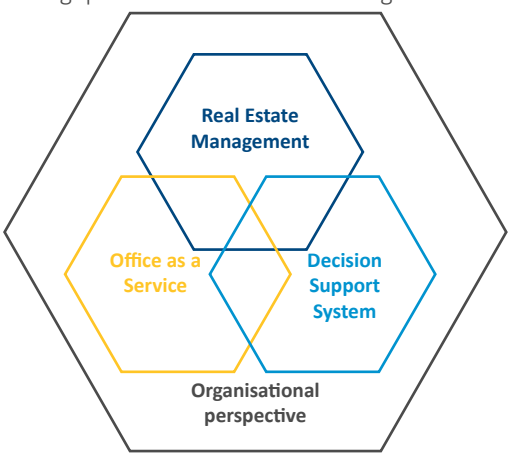


Figure XX: *Scope definitie*

Het organisatieperspectief zal gebruik maken van het perspectief van de gebruiker/aanbieder van een ‘Office as a Service’ strategie. Dit is een organisatie die een ‘Office as a Service’ strategie implementeert binnen hun eigen portfolio en waarvan ze zowel gebruiker als aanbieder van zijn.

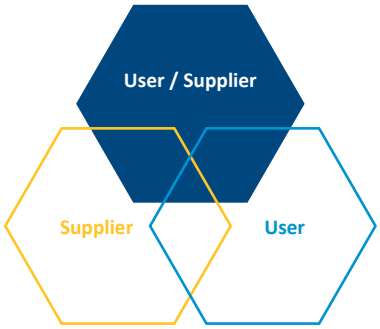


Figure XXI: *Organisatie perspectief*

2. METHODOLOGIE

ONDERZOEKSONTWERP

Het onderzoek wordt uitgevoerd als een hybride onderzoek waarin operationele en empirische onderzoek elementen worden gecombineerd. Om de hoofdonderzoeksvraag te beantwoorden zijn verschillende onderzoek stappen nodig. De aanpak van dit onderzoek bestaat uit negen min of meer opeenvolgende stappen, binnen drie iteratieve lussen. Figuur XXII toont het ontwerp van de onderzoeksmethode en is gebaseerd op de onderzoekend ontwerp cycli van Hevner and Chatterjee (2010).

De negen stappen die worden ondernomen voor dit onderzoek zijn:

- Stap 1: Bepalen van de context;
- Stap 2: Probleemstelling en onderzoeksdoelstelling;
- Stap 3: Literatuur onderzoek;
- Stap 4: Conceptueel ontwerp van de 'strategisch beslismodel';
- Stap 5: Interviews;
- Stap 6: Voorlopig ontwerp van de 'strategisch beslismodel';
- Stap 7: Verificatie en validatie van het voorlopig ontwerp;
- Stap 8: Gedetailleerd ontwerp van de 'strategisch beslismodel';
- Stap 9: Conclusie, discussie en aanbevelingen voor verder onderzoek

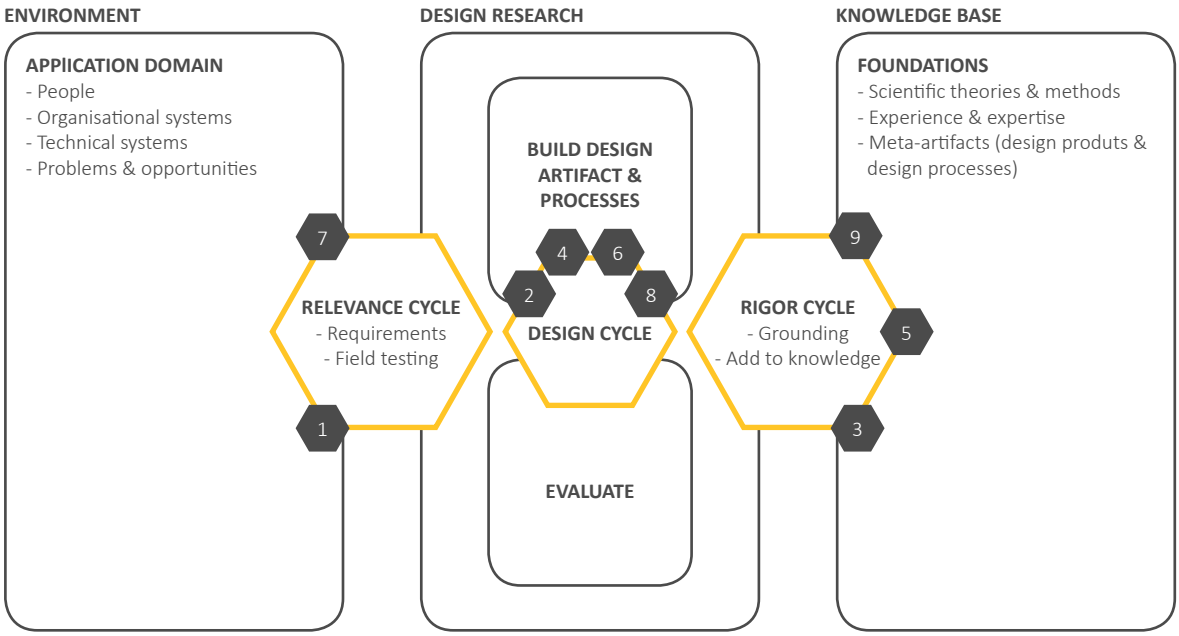


Figure XXII: *Onderzoeksontwerp*

3. LITERATUUR STUDIE

Een literatuuronderzoek is uitgevoerd (stap 3) om een overzicht te krijgen van de bestaande theorieën en kennis met betrekking tot de hoofdonderwerpen: Vastgoed management, beslis modellen en 'Office as a Service'.

VASTGOED MANAGEMENT

De basis van vastgoed management is de veronderstelde toegevoegde waarde van vastgoed op prestaties, zowel negatief als positief (Den Heijer, 2011). Vastgoed wordt de vijfde bron van input voor een organisatie genoemd De Jonge, 1996; Joroff, Lambert, & Louargand, 1993; Krumm, 1999) en heeft dertien doelstellingen waardoor vastgoed waarde kan toevoegen aan een organisatie (Valks, Arkesteijn, Den Heijer, 2018). Op basis van het Corporte Real Estate Management model kunnen deze dertien veronderstelde toegevoegde waarden worden verdeeld over de vier perspectieven van stakeholders, die allen een verschillend prestatie criteria hanteren.

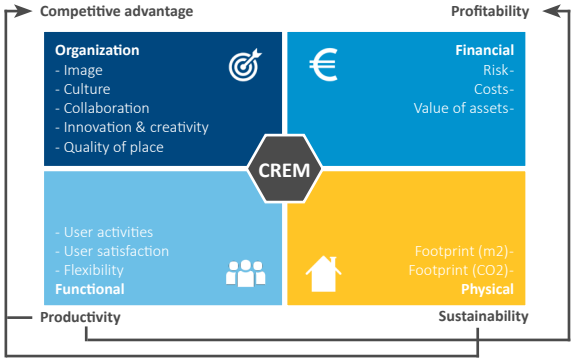


Figure XXIII: Vastgoed Management

BESLISMODELLEN

Besluitvorming op het gebied van (Corporate) Real Estate Management vereist meerdere doelstellingen. Ze zijn vaak tegenstrijdig en komen van belanghebbenden gedreven door verschillende doelen. Om deze reden is het concept van Multi-Criteria Decision Analysis geïntroduceerd om het besluitvormingsproces te ondersteunen door expliciet rekening te houden met meerdere criteria om daarmee de meest geschikte beslissing te nemen. Met deze aanpak worden de alternatieven beoordeeld aan de hand van gedefinieerde criteria om daarmee het meest geschikte alternatief te kiezen. In deze aanpak wordt er gebruik gemaakt van wegingsfactoren, ranking en voorkeuren.

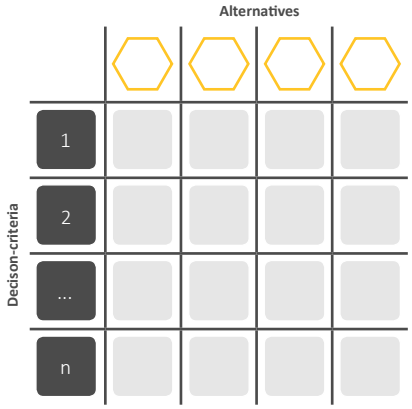


Figure XXIV: Beslismodellen

'OFFICE AS A SERVICE'

'Office as a Service' is gebaseerd op de onderliggende theorieën over 'servitization' en 'Product-Service-Systemen'. Een flexibel service kantoor wordt gedefinieerd als ruimte binnen een gebouw dat op service basis wordt verhuurd, onderverhuurt of in licentie wordt gegeven aan derden. De services omvatten alle gebouwservices en een menu met zakelijke ondersteuningsservices. 'Office as a Service' kan worden geanalyseerd aan de hand van de managementniveaus zoals gedefinieerd door Joroff et al. (1993): strategisch, tactisch en operationeel. Deze analyse omvat vier alternatieve strategieën, drie tactische oplossingen en operationeel in drie groepen variabelen waarop een Product-Service-Systeem is gebaseerd: productvariabelen, servicevariabelen en algemene variabelen.

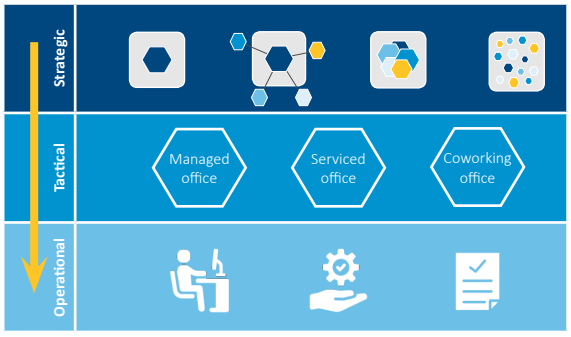


Figure XXV: 'Office as a Service'

4. CONCEPTUEEL ONTWERP

De ontwikkeling van het conceptuele ontwerp (stap 4) is het resultaat van de integratie van de vastgestelde specificaties die uit de literatuurstudie (stap 3) naar voren zijn gekomen met betrekking tot de hoofdonderwerpen: Vastgoed management, beslismodellen en 'Office as a Service'. Gerelateerd aan de tweede fase van een Multi-Criteria Decision Analysis proces, focust zich dit op 'het bouwen van het model' en 'het gebruik van het model'.

Model bouwen

Om het 'strategisch beslismodel' te bouwen wordt er gebruikt gemaakt van de formele procedure van een MCDA:

- *Specificatie van alternatieven:* De alternatieven waarmee rekening wordt gehouden zijn gebaseerd op de vastgestelde specificaties van 'Office as a Service' waarbij de vier 'Office as a Service' strategieën en die drie 'Office as a Service' oplossingen worden gebruikt.
- *Definiëren van de besluitvormingscriteria:* De besluitvormingscriteria waarmee rekening wordt gehouden zijn gebaseerd op de vastgestelde specificaties van Vastgoed management. Hierin worden de vier stakeholder perspectieven met hun bijbehorende veronderstelde toegevoegde waarde gebruikt.
- *Beoordelen van de alternatieven in relatie tot de besluitvormingscriteria:* Het beoordelen van de alternatieven op basis van de besluitvormingscriteria vindt plaats in stap 5 van het onderzoek.
- *Toewijzen wegingsfactor voor ieder besluitvormingscriteria:* Iedere stakeholder kan hun voorkeur aangeven met betrekking tot de besluitvormingscriteria. Daarnaast krijgt ieder stakeholder perspectief een wegingsfactor in het besluitvormingsproces.

Model gebruiken

Het gebruik van het 'strategisch beslismodel' hangt samen met de derde stap van het 'Design an Accommodation Strategy' framework: weeg en selecteer alternatieven (om toekomstig aanbod voor een organisatie te bepalen). Bij het vertalen van deze stap in het gebruik van de 'strategisch beslismodel' moeten de volgende stappen worden gezet:

- *Bepaal de toekomstige vraag:* De toekomstige vraag wordt bepaald door de vier stakeholder perspectieven hun voorkeuren en/of doelstellingen te laten bepalen in combinatie met een gegeven weegfactor per stakeholder perspectief.
- *Ontwerp alternatieven:* De alternatieven zijn al ontworpen en zijn gebaseerd op de vastgestelde specificaties van 'Office as a Service' waarbij vier 'Office as a Service' strategieën en drie 'Office as a Service' oplossingen worden gebruikt.
- *Weeg en selecteer alternatieven:* Het beoordelen van de alternatieven op basis van de besluitvormingscriteria vindt plaats in stap 5 van het onderzoek.
- *Bepaal toekomstig aanbod:* Op basis van de gekozen doelstellingen in combinatie met de gegeven wegingsfactor per stakeholder perspectief, kan een totaal score per alternatief worden berekend om de optimale oplossing te bepalen.

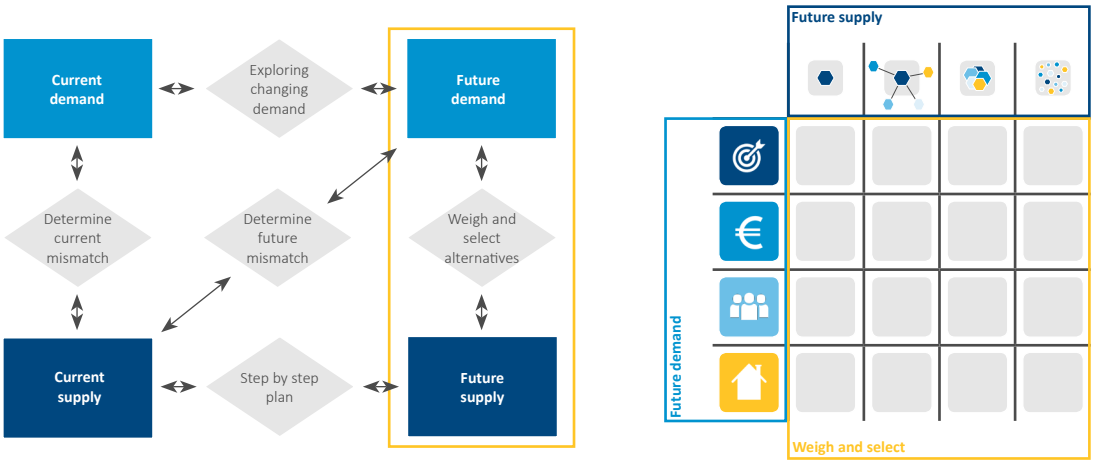


Figure XXVI: *Conceptueel ontwerp*

5. VOORLOPIG DESIGN

De ontwikkeling van het voorlopig ontwerp van het 'strategisch beslismodel' (stap 6) is het resultaat van de integratie van de data uit de interviews (stap 5) met het conceptuele ontwerp (stap 4). Het doel van het interview proces was om het conceptuele ontwerp, dat gebaseerd was op het literatuuronderzoek (stap 3), te verifiëren, aan te vullen en te verfijnen. De gegevens uit de interviews werden gecategoriseerd volgens de gedefinieerde besluitvormingscriteria (waarom), de specificatie van alternatieven (wat) en de relatie daartussen (waarom-wat).

WAAROM

Toegevoegde waarde

Van de dertien veronderstelde toegevoegde waarden die in aanmerking worden genomen als input voor het conceptuele model, kunnen acht toegevoegde waarden worden gerelateerd aan het concept 'Office as a Service'. Deze acht toegevoegde waarde, met de bijbehorende belangrijkste prestatie indicatoren, zijn opgenomen in de ontwikkeling van het voorlopig ontwerp. De resterende vijf toegevoegde waarden zijn, hoewel niet gerelateerd aan het concept 'Office as a Service', niet verwijderd uit het voorlopige ontwerp van de 'strategische beslissingsbenadering'. Dit komt omdat deze toegevoegde waarden nog steeds kunnen worden vermeld in de vervolg stap van het onderzoek.'strategic decision approach'.

	Supporting image	Intern > extern
	Supporting culture	Intern > extern
	Stimulating collaboration	Variety of user groups
	Stimulating innovation	Unplanned > planned encouters
	Improving quality of place	
€	Controlling risk	Outsourcing
	Decreasing costs	cost per desk
	Increasing value of assets	
	Supporting user activities	
	Increasing user satisfaction	
	Increasing flexibility	> contract duration
	Reducing footprint (m2)	square meters / desk
	Reducing footprint (CO2)	

Figure XXVII: *analyse toegevoegde waarde*

Gebruikersbehoefte van ruimte

Hoewel het conceptuele ontwerp van het 'strategisch beslismodel' rekening houdt met de toegevoegde waarde die bijdragen aan de strategische doelen van een organisation, wordt er geen rekening gehouden met het optimaliseren van de relatie tussen vraag en aanbod op het gebied van ruimtegebruik. Gibson en Lizieri (1999) hebben het core/non-core concept toegepast op de vastgoedportefeuille en daarmee het Core-Periphery operationeel vastgoedportefeuille ontwikkeld.

Aan de hand van dit model worden vijf typologieën van de vraag naar gebruikersruimte toegevoegd aan de besluitvormingscriteria:

- Migrerend in;
- Migrerend uit;
- Flexibele bezetting;
- Kortstondige vraag;
- Constante vraag;

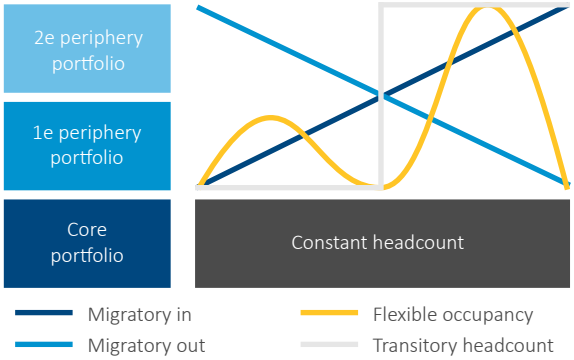


Figure XXVIII: *analyse gebruikersbehoefte van ruimte*

WAT

Op basis van de alternatieven die worden meegenomen in het conceptuele ontwerp, zijn de drie tactische oplossingen van 'managed office', 'serviced office' en 'coworking office' geëvalueerd. Op basis van de evaluatie in relatie tot de ontwikkeling van het voorlopige ontwerp, is ervoor gekozen om te focussen op de strategische alternatieven en de tactische alternatieven te behouden als een aanbeveling voor toekomstig onderzoek.

WAAROM-WAT

Op basis van de acht toegevoegde waarden met hun bijbehorende belangrijkste prestatie indicatoren en de vijf typologieën van de vraag naar gebruikersruimte worden de vier 'Office as a Service' strategieën ten opzicht van elkaar beoordeeld. Zij worden ten opzichte van elkaar beoordeeld van 1 tot 4, waarin 1 de voorkeursoptie is in relatie tot de besluitvormingscriteria.

6. GEDETAILLEERD ONTWERP

De ontwikkeling van het gedetailleerde ontwerp van de 'strategisch beslismodel' (stap 8) is het resultaat van de integratie van de data uit de case studies (stap 7) met het voorlopige ontwerp (stap 6). Het doel van de case studies was om het voorlopige ontwerp, dat gebaseerd was op het literatuuronderzoek (stap 3) en een interview proces (stap 5), te verifiëren, aan te vullen en te verfijnen.

IN-CASE ANALYSE

Het doel van de in-case analyses was het verzamelen van gegevens met betrekking tot hun beoogde vraag, zowel over de beoogde toegevoegde waarden als de vraag naar gebruikersruimte, hun gekozen 'Office as a Service' strategie in relatie tot het Core-Periphery model van Gibson en Lizieri (1999) en ten slotte de relatie tussen vraag en aanbod.

De drie case studies die hiervoor werden gebruikt om de gegevens te verzamelen waren: ING met de ontwikkeling van hun nieuwe internationale hoofdkantoor in de Bijlmerdreef in het zuidoosten van Amsterdam, Microsoft met de renovatie van hun kantoor op Schiphol en Uber met hun nieuwe kantoor dichtbij Amsterdam Amstel.

CROSS-CASE ANALYSE

Een cross-case analyse werd gemaakt op basis van de uitgevoerde case studies. Met deze cross-case analyse werden de gegevens uit de case studies gecategoriseerd volgens de gedefinieerde besluitvormingscriteria (waarom), de specificatie van alternatieve 'Office as a Service' strategieën (wat) en de relatie tussen beide (waarom-wat). Hierna wordt een patroonvergelijkingstechniek gebruikt om overeenkomsten en verschillen te identificeren.

De cross-case analyse toonde hierbij het volgende:

- Dat van de dertien veronderstelde toegevoegde waarden van vastgoed, negen toegevoegde waarden worden genoemd als een doelstelling waaraan de huisvestingsstrategie moest bijdragen. ING en Microsoft richtten zich op de linkerkant van het CREM-model, gericht op de instelling. Terwijl Uber zich richt op de rechterkant, gericht op het vastgoed.
- Op basis van de vraag naar gebruikersruimte, de volgende interpretatie tussen het Core-Periphery model van Gibson en Lizieri (1999) gegeven kan worden: een stapsgewijze stijgende relatie waar de vraag naar toenemende flexibiliteit wordt beantwoord door een meer externe 'Office as a Service' strategie.
- Op basis van de cross-case analyse (waarom-wat) kunnen de volgende conclusies worden getrokken: Ten eerste, de cross-case analyse (waarom-wat) onderbouwt de conclusie van de cross-case analyse 'wat' dat de toename van flexibiliteit wordt beantwoord door een meer externe strategie van 'Office as a Service'. Omdat beide toegevoegde waarden 'risicobeheersing' en 'toenemende flexibiliteit' gerelateerd zijn aan een externe 'Office as a Service' -strategie. En ten tweede zijn de toegevoegde waarden vanuit organisatorisch perspectief meer gerelateerd aan een interne 'Office as a Service'-strategie.

ONTWIKKELING GEDETAILLEERDONTWERP

Voor de ontwikkeling van het gedetailleerde ontwerp werden de empirische bevindingen uit de case studies geconfronteerd met het voorlopige ontwerp van het strategische beslismodel. Dit resulteerde in een gedetailleerd ontwerp van het strategisch beslismodel waarin rekening gehouden wordt met acht toegevoegde waarden, verdeeld over alle vier de perspectieve van stakeholders en vijf typologieën van de gebruikersbehoefte van ruimte waar de vraag naar toenemende flexibiliteit wordt beantwoord door een meer externe 'Office as a Service' strategie.

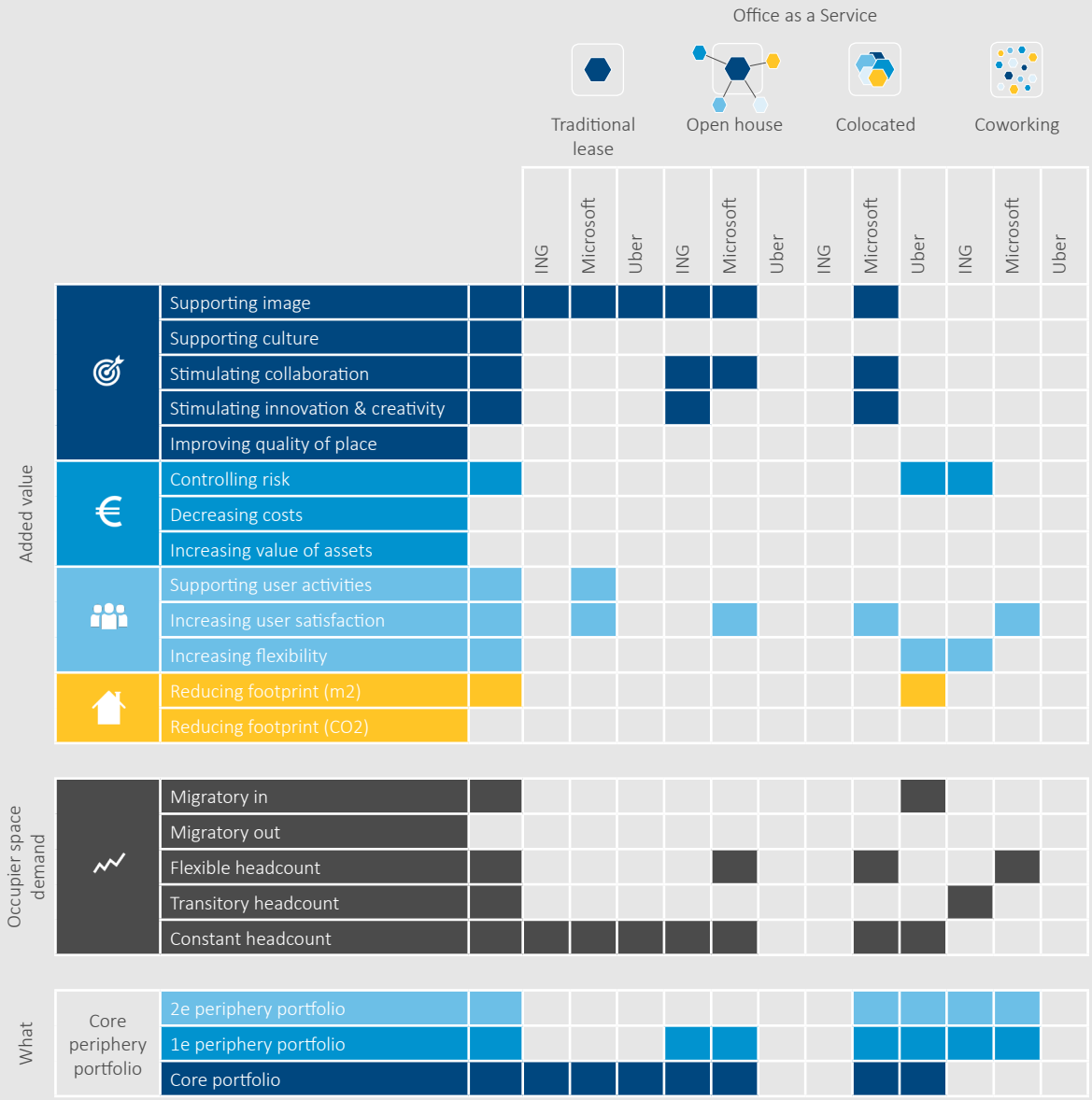


Figure XXIX: *Cross-case analyse*

7. CONCLUSIE

De integratie van de theoretische input van de literatuurstudie (stap 3) en de verzameling en analyse van gegevens afgeleid van stap 4 tot en met 8 worden gebruikt om antwoord te geven op de onderzoeksvraag en om tot conclusies te komen.

Om de hoofdvraag te beantwoorden: “Hoe kan ‘Office as a Service’ een strategische besluit zijn voor een organisatie om hun vastgoed te optimaliseren om daarmee maximale toegevoegde waarde te verkrijgen, wordt een strategisch beslismodel ontwikkeld op basis van het concept van een Multi-Criteria Decison Analysis (MCDA) model.

De ontwikkeling van dit Multi-Criteria Decison Analysis model integreert de besluitvormingscriteria, die zijn gebaseerd op de veronderstelde toegevoegde waarde van vastgoed en de vijf typologieën van de gebruikersbehoefte van ruimte, met de alternatieve ‘Office as a Service’ strategieën.

Toegevoegde waarde

Op basis van het model van Den Heijer (2011) om de toegevoegde waarde van vastgoedbeslissingen te beoordelen aan de hand van de vier stakeholder perspectieven en hun bijbehorende veronderstelde toegevoegde waarden, kunnen acht toegevoegde waarden verdeeld over alle vier de stakeholder perspectieven worden gerelateerd aan het concept van ‘Office as a Service’.

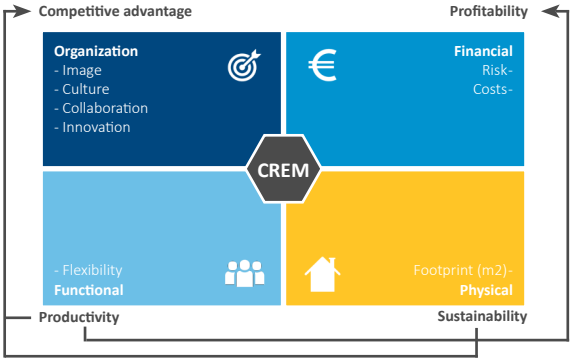


Figure XXX: *Toegevoegde waarde ‘Office as a Service’*

Gebruikersbehoefte van ruimte

Naast de veronderstelde toegevoegde waarde van vastgoed die bijdraagt aan de strategische doelen van een organisatie, wordt een operationeel aspect toegevoegd aan de besluitvormingscriteria om zo rekening te houden met de vijf typologieën van de gebruikersbehoefte van ruimte. Op basis van het Core-Periphery model van Gibson en Lizieri (1999) in relatie tot de alternatieve ‘Office as a Service’ strategieën resulteert dit in de volgende interpretatie: een stapsgewijze stijgende relatie waar de vraag naar toenemende flexibiliteit wordt beantwoord door een meer externe ‘Office as a Service’ strategie.

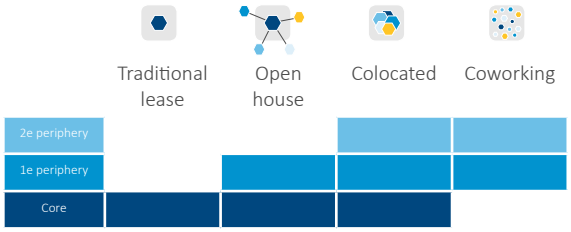


Figure XXXI: *Core-Periphery vs ‘Office as a Service’*

De integratie van beide groepen van besluitvormingscriteria leidt tot het volgende resultaat: Een strategisch beslismodel voor ‘Office as a Service’ wat door organisaties gebruikt kan worden om hun vastgoed te optimaliseren om daarmee maximale toegevoegde waarde te verkrijgen. Het strategisch beslismodel voor ‘Office as a Service’ is weergegeven in figuur XXXII.

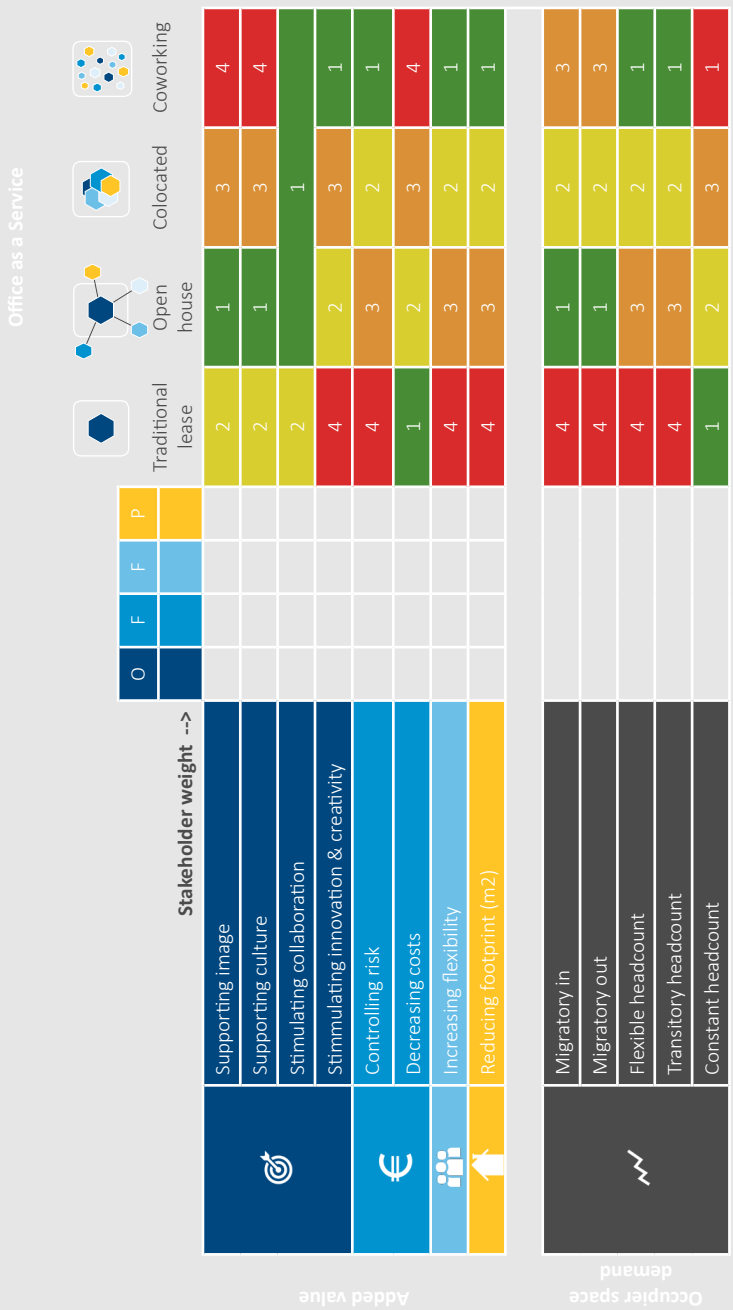
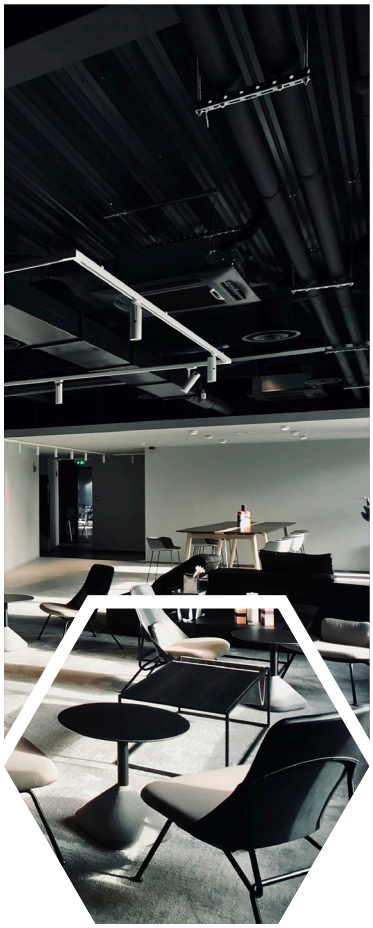
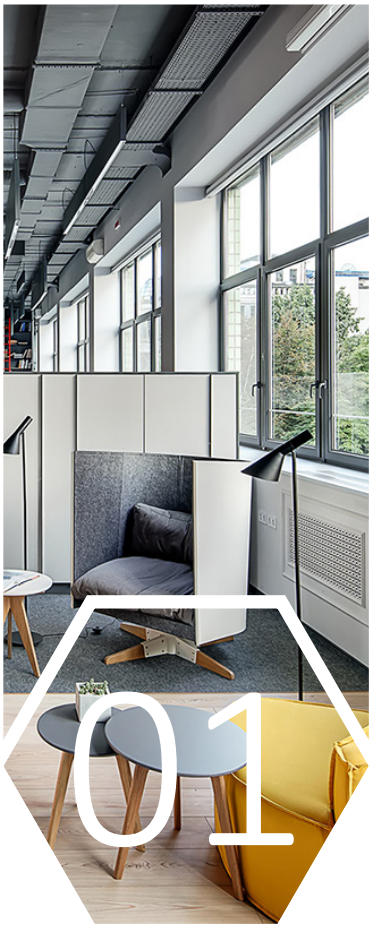


Figure XXXII: Strategisch beslismodel 'Office as a Service'



EXECUTIVE SUMMARY

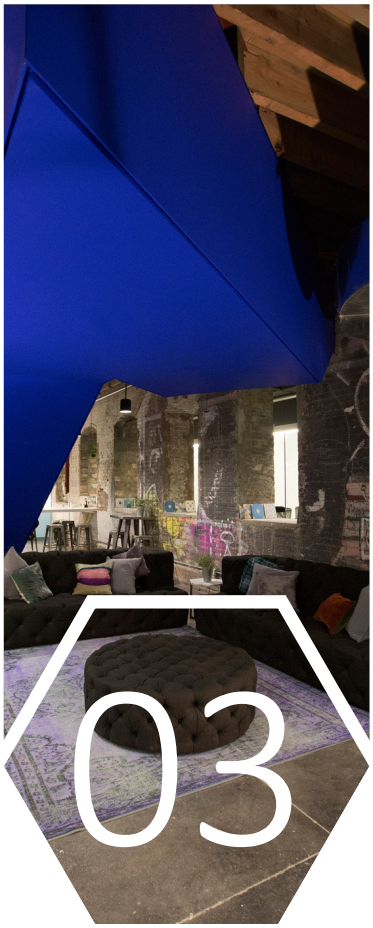


01

RESEARCH PROPOSAL

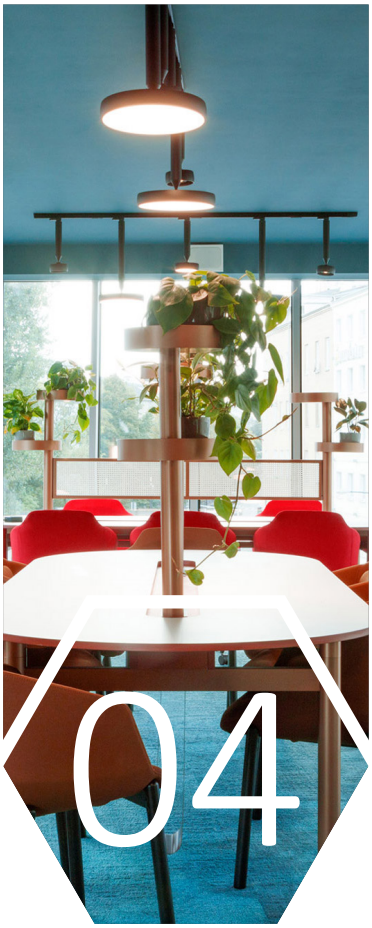
02

RESEARCH METHODOLOGY



03

LITERATURE STUDY

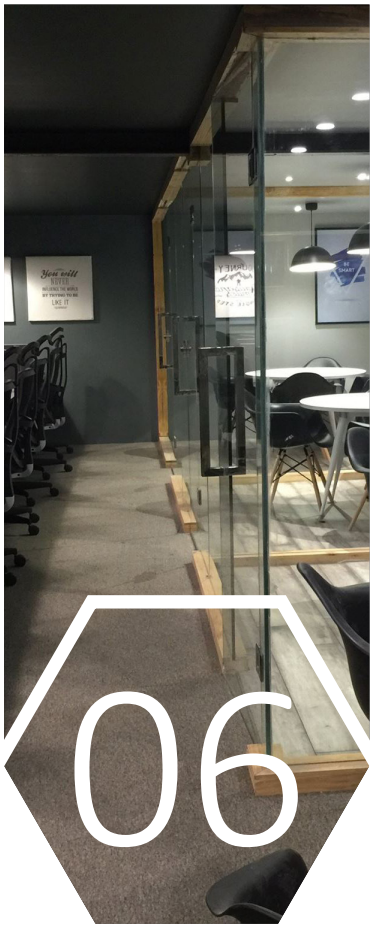


04

CONCEPTUAL DESIGN

05

PRELIMINARY DESIGN



06

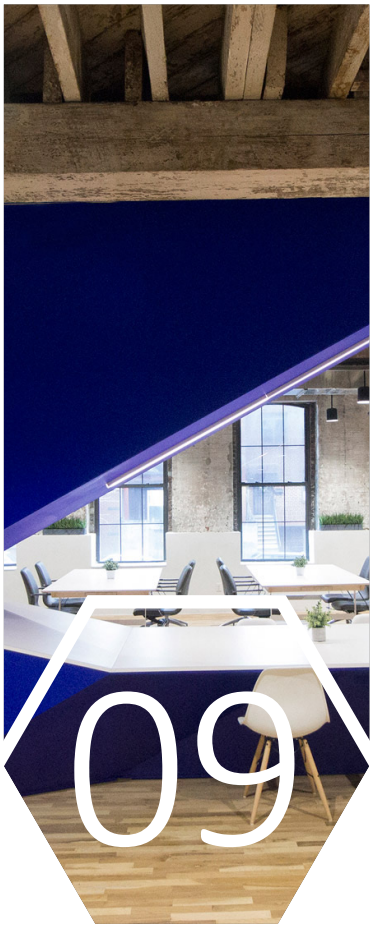
DETAILED DESIGN

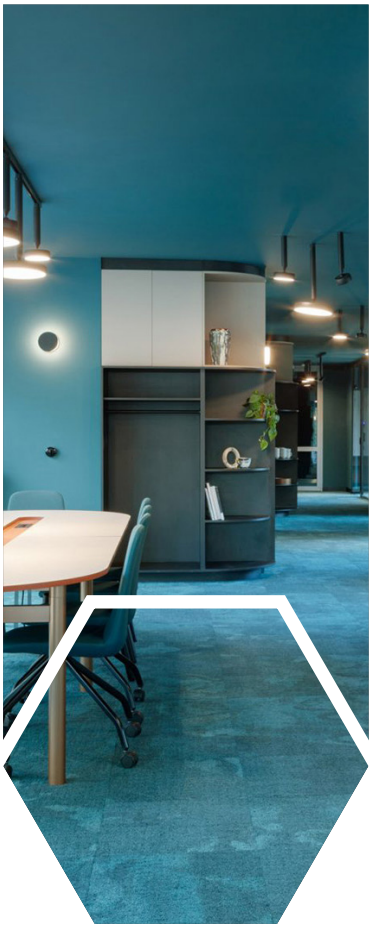
07

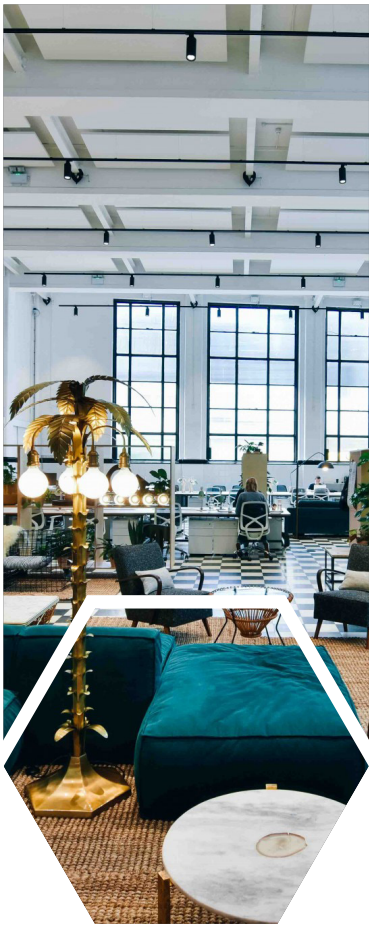
CONCLUSION

08

RECOMMENDATIONS







REFLECTION

REFERENCES

APPENDICES

LIST OF ABBREVIATIONS

Abbreviation	Term
CRE	Corporate Real Estate
CREM	Corporate Real Estate Management
DAS-frame	Designing an Accommodation Strategy frame
DDS	Decision Support System
HR	Human Resources
KPI	Key Performance Indicator
MCDA	Multi-criteria Decision Analysis
OaaS	Office as a Service
PSS	Product-Service-System
REM	Real Estate Management

Table I: *List of abbreviations*

READERS GUIDE

The following graduation report is build up into three parts: input, throughput and output. The content of these parts of the research will be described shortly.

Part A: Input

The first part of this report forms the input of this graduation research and presents the main concepts. This part starts with chapter 1, in which the research proposal is presented. This chapter is followed by chapter 2, in which the research methodology is explained. It will end with chapter 3, in which the literature study of this graduation research is presented. This literature study is conducted in order to get an overview of the existing theories and knowledge about the related topics. The result of part A: Input is a framework for data collection and required mananagement information.

Part B: Throughput

The second part of this report forms the throughput of this graduation research. Within this part the development of the strategic approach takes place. This part starts with chapter 4, in which the conceptual design of the strategic approach is developed based on the output of part A. This is followed by chapter 5, in which the conceptual design is verified, supplemented and refined by an interview round into a preliminary design. It will end with chapter 6, in which a case study round takes place to test the preliminary design. This results in a detailed design of the strategic approach.

Part C: Output

The final part of this report forms the output of this graduation research. This part starts with chapter 7, in which the conclusion is presented that gives answer to the main research question and sub-questions. This chapter is followed by chapter 8, in which the recommendations for practise and further research are discussed. It will end with chapter 9, in which will be reflected on the graduation research. The result of part C: output will be lessons for theory and practice together with a strategic approach to optimize the physical resource of organisations by the implementation of Office as a Service.

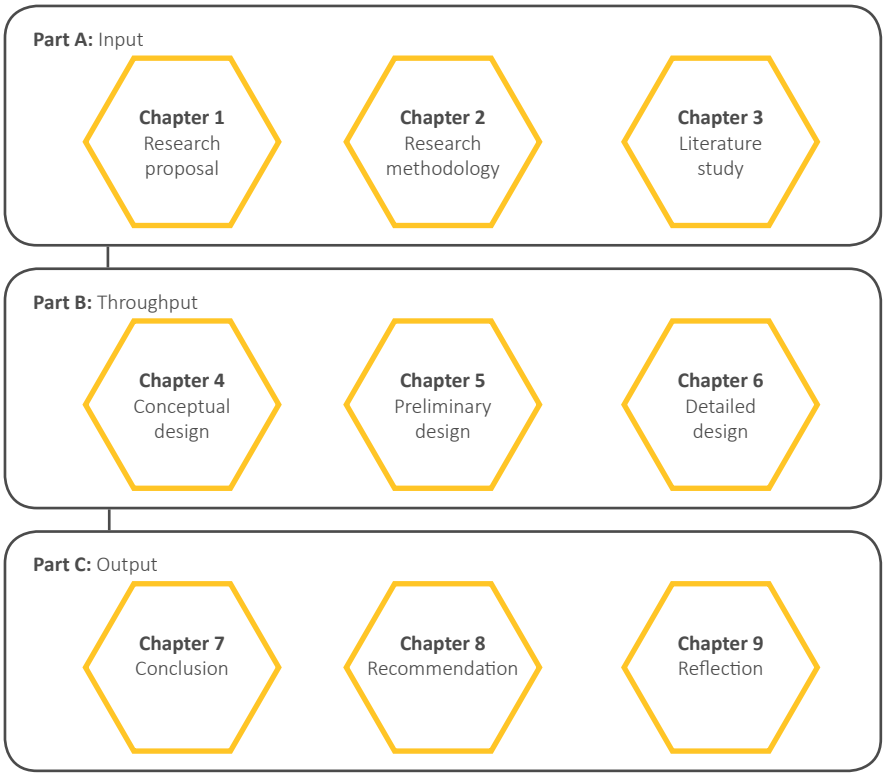


Figure XXXIII: *Readers guide*

RESEARCH PROPOSAL

1

1. RESEARCH PROPOSAL

This chapter functions as an introduction for the research proposal. First, it will be explained throughout an introduction of the research topics. Secondly, the problem analysis is given that will be concluded into the problem statement. This leads to the research objective and research questions. Finally, the relevance of the research is discussed from different perspectives.

1.1. INTRODUCTION

Organisations need real estate to enable them to perform their activities effectively and efficiently in a safe, protected and pleasurable environment. Typically, large organisations use many buildings to perform their activities. The alignment of their real estate strategy with organisational strategy and/or user needs is however a long-standing problem (Heywood & Arkesteijn, 2017). The following two paragraphs will present some of the driving forces that change both the demand and supply in real estate.

1.1.1 CHANGING DEMAND

Today, work is fundamentally different than it was 20, 10 or even just five years ago. Furthermore, the pace of change, fuelled by technology and a host of economic and cultural trends, is accelerating faster than ever before. Drivers of this changes are:

Economy

Business is changing faster than ever before. Companies must evolve alongside new entrants and technology advancements to remain competitive and relevant in the dynamic landscape. The skills and resources needed to drive business will be impacted and under constant pressure, making future planning a challenge.

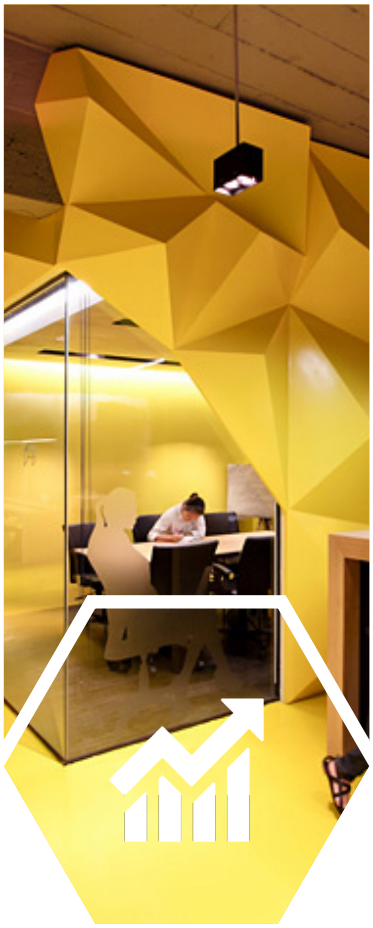
In addition, the workforce is becoming more liquid. Project-based teams are replacing hierarchical models as organizations evolve to move more quickly. Freelancers currently make up 36% of the global workforce and, at the current growth rates, are anticipated to represent the majority of the workforce by 2027.

Technology

Technology is changing the way we interact. Mobile devices, cloud computing and other enablement technologies allow employees to work untethered throughout their day. The right tools and connectivity allow employees to be more productive, no matter where or when they work.

Society

Another force driving the change of demand is the generational shift within the workforce. Generational diversity in the workplace is greater than ever before. Millennials represent the new workforce generation. It is estimated that by 2025, 75% of the workers will be millennials. They bring a different mindset with evolving expectations for a unique work environment.



ECONOMY

Growth of SME's and self-employment

Rise of entrepreneurial economy / contingent workforce

Knowledge industries growing faster than other sectors

Access to talent and related drive for diversity

TECHNOLOGY

Mobile and social technologies enable mobile workforce

Rise of on-demand apps

Connectivity and communication is independent of location

SOCIETY

Broad societal expectations of choice and greater work-life balance

Environmental

1.1.2 CHANGING SUPPLY

Just as drivers and trends influence the demand for office space, there are drivers and trends that influence the supply of office space. This graduation research takes a closer look into the following two trends: 'servitization' and 'sharing economy' and their relation to real estate and especially to office space. All three will be shortly discussed in the following paragraphs.

Servitization

Society is moving rapidly from a world of products to one of services (servitization). People are becoming much less interested in acquiring more possessions. Instead, they see much more benefit in being provided with services, experiences and ephemeral pleasures. Servitization is the process of adding services to products. Already in 1988 Vandermwerwe and Rada (1988) mention this concept, stating that "Modern corporations are offering fuller market packages or 'bundles' of customer-focused combinations of goods, services, support, self-service, and knowledge. But services are beginning to dominate" (Vandermerwe & Rada, 1988, p.314). Examples can be found in Uber instead of cars, Spotify instead of CD's and Netflix instead of DVD's.

Figure 1.1.: *'Servitization'*

Sharing economy

The 'sharing economy' started to emerge in the beginning of this decade due to the changing values and mindsets of the public and the development of technology-enhanced digital platforms. As an economic model, this enables individuals to share access to under-utilized goods or services for monetary or nonmonetary benefits (Leung, Xue, & Wen, 2019). Therefore, the 'sharing economy' is sometimes also referred to as 'collaborative consumption' or 'the access economy'. The 'sharing economy' is an economic model often defined as a peer-to-peer (P2P) based activity of acquiring, providing or sharing access to goods and services that are facilitated by a community-based on-line platform. At the heart of the rising concept of the 'sharing economy' is the role of digital technologies. In many conceptions, the 'sharing economy' system is predicated on some kind of efficient, scalable technology, which brings large networks of people together and matches them to the goods or services they need (Sutherland & Hossein Jarrahi, 2018). These sharing platforms can be viable given the necessary conditions (Baum, 2017):

- A diverse, widely distributed source of demand
- A diverse, widely distributed and heterogeneous source of supply
- No dominant, efficient mechanism for bringing demand and supply together
- Potential financials gains to the demand side, the supply side and an intermediary
- Scalability

Office as a Service

This twin trend of 'servitization' and 'sharing economy' is also affecting real estate and the world of work. As a result of this, a new theme has emerged: ''Office as a Service''. On demand, and where we buy exactly the features and services we want, whenever and wherever we are. The real estate industry is therefore moving from being a physical product to a service; in essence a provider and seller of user experiences. The sharing economy of collaborative consumption enabled by new applications and geo-location services is beginning to revolutionize the ways that firms and individuals procure and obtain workspaces. This challenges the supply-side driven mentality of landlords, developers and the real estate industry. The collaborative consumption model provides users with much greater choice and control to procure their own work environment on an as-needed basis by the hour or day in any location or type of work environment that they want. This shift to an individualistic and consumerist model of workspace provides a significant alternative to the conventional supply chain of twentieth century real estate and office development. Office space can now be consumed collaboratively in the same way that we rent cars or movies (e.g., Zipcar or Netflix). In the field of real estate, organizations and individuals can obtain space by the hour, when and where the need it, through such applications as Liquidspace. Such services not only open up many choices for end users of workspace, they also enable tenants and landlords to better utilize their own under-occupied space. These co-working and workspace-as-a-service models offer services that are responsive to user demands in contrast to the limited services associated with the real estate conventions of leasing or buying office space. They respond to users' attempts to work around the normal real estate and facilities processes by self-designing and procuring their own spaces to support their needs for faster, better, more engaging and more flexible work processes. Such users are increasingly empowered to procure their own physical and virtual environments. In so doing, they are achieving what Duffy has proposed, which is to reinvent the supply chain or, following Groak, to create a so-called 'demand chain' intended to reverse the wastefulness of the Taylorist model of office work and its associated models of space and building development. These kinds of solutions transcend the conventional boundaries of landlord and tenant, user and designer, while also taking advantage of the great flexibility provided by networked technology and its ability to disrupt supply chains.

1.2. PROBLEM ANALYSIS

Organisations need real estate to enable them to perform their activities effectively and efficiently in a safe, protected and pleasurable environment. Typically, large organisations use many buildings to perform their activities. The alignment of their real estate strategy with organisational strategy and/or user needs is however a long-standing problem (Heywood & Arkesteijn, 2017).

Responding to the emerging trends in technology, economy and society (presented in§1.1.1.), the change of demand/user needs becomes larger and more unpredictable. This can be made visible with a demand graph over time which becomes more dynamic and erratic (figure 1.2.). With real estate as relatively static, this results in a more frequent and bigger mismatch between the current demand and supply of an organisation..

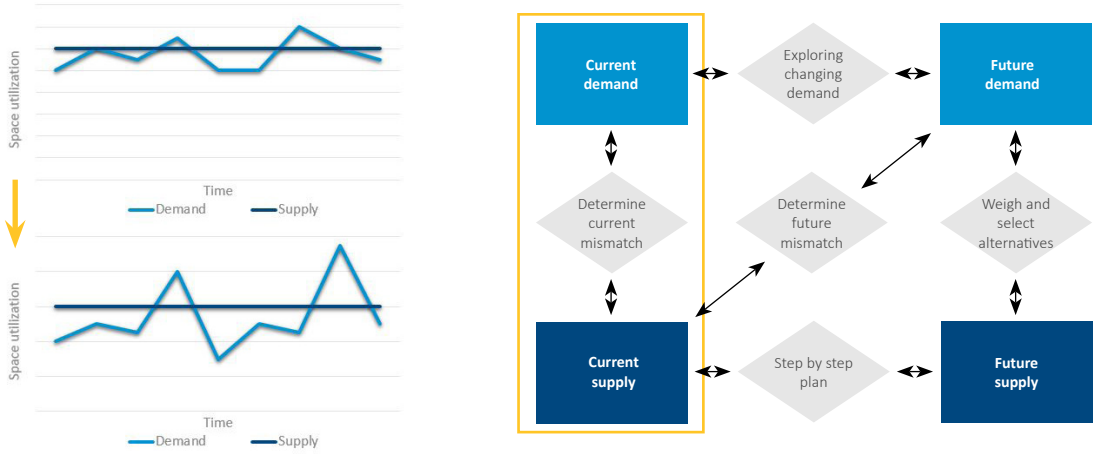


Figure 1.2.: Mismatch according to the DAS-framework

That this alignment is a long-standing problem is made visible in a research conducted by Lokhorst, Remøy and Koppels (2013). In their research about the office market, they found a mismatch between the demand for office space and the actual supply, resulting in a high level of vacancy. This research is supported by an occupancy study of JLL (2017a) under 81 organisations. This shows that on global level at least 77% of the organisations have a vacancy level between 10-19% (figure 1.3.).

Figure 1.3.: Occupancy metrics (JLL, 2017a)

To understand the consequences of this vacancy level, a SWOT-analysis can be made to see what the strengths, weaknesses opportunities and threats are related to vacancy. Table 1.1. gives an overall summary of these consequences. Particular strengths are the flexibility and speed to market because the oversupply of space can be easily repurposed when needed. However, negatives that can be listed are the inefficient use of resources due to the fact that this oversupply needs to be financed (rent, fit out, insurance and cleaning costs) and heated, while not in use.

Strengths	**Weakness**
□ Flexibility □ Speed to market □ More m2/employee	□ Inefficient use of resources □ Loss of cohesion □ Image □ Opportunity costs
Opportunities	**Threats**
□ Sharing economy □ Transformation	□ Become structureal vacancy

Table 1.1.: SWOT-analysis vacancy

The question is: how to deal with the long-standing problem of the alignment between real estate strategy with organizational strategy and/or user needs, whichs result in a level of vacancy? As a reaction to the constantly changing and unpredictable demand, the real estate market responded with 'Office as a Service' concepts as presented in §1.1.2.. Therefore three ways of handling can be implied (figure 1.4.):

- Doing nothing
- Internal flexibility
- External flexibility

Within the first option the organisation accepts the fact that there will be an underutilization of space with its positive and negative effects. The other two options are based upon the concept of core/non-core concept (Gibson & Lizieri, 1999). In which the flexibility of the non-core office space will be solved internally or externally. But what type of flexible office space is right for an organisation?

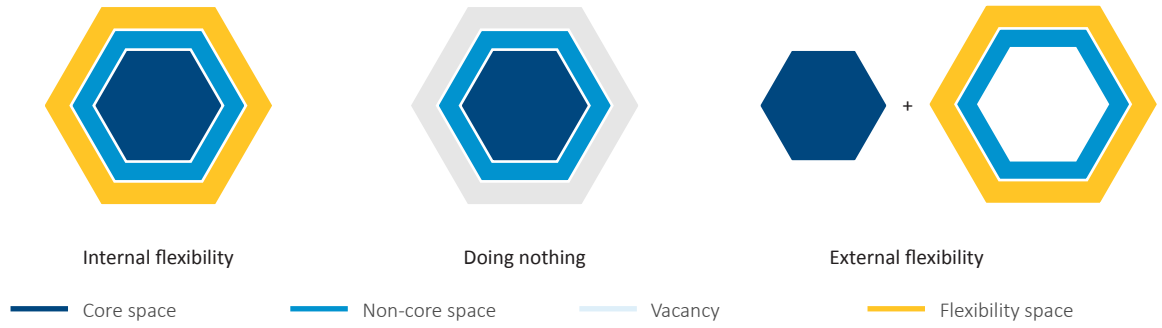


Figure 1.4.: *Handling with mismatch*

1.3. PROBLEM DEFINITION

The relationship between a building (supply) and its users (demand) is constantly changing. In the introduction [§1.1.1] some of the driving forces behind the changes in office work were presented that have an impact on the demand. Because the supply – demand relationship is changing continuously, most of the time there is a mismatch between what a building can offer and what an organisation requires. Therefore, one of the biggest challenges in Corporate Real Estate Management is reducing the gap between the high speed of business and the slow speed of real estate, i.e. between the so-called dynamic real estate demand and relatively static real estate supply.

The gap (mismatch) between the so-called dynamic real estate demand and relatively static real estate supply can be made visible in a space utilization chart in which space utilization and time are combined in a line graph (figure 1.6.). Although this space utilization chart is a schematic representation of the mismatch, figure 1.5. showed that this mismatch occurs at a global level.

Figure 1.5.: *Problem definition*

1.4. RESEARCH OBJECTIVE

Dewulf, De Jonge and Krumm (2000) define the objective of Corporate and Public Real Estate Management as:

"Objective of Corporate & Public Real Estate Management is the alignment of the real estate portfolio of a corporation of a public authority to the needs of the core business, in order to obtain maximum added value for the business and to contribute optimally to the overall performance of the organisation."

The research objective of this graduation research responds to this definition of the objective of Corporate Real Estate Management, the problem analysis and the problem statement. Therefore, the research objective of this graduation work is to develop and present knowledge of how the physical resource can be enhanced by implementing 'Office as a Service'. Because the mismatch is dynamic and changes frequently, a strategic decision approach model to managing the mismatch between the user organisation and the building is proposed in order to offer a way of approach these problems.

The purpose of this work is not to develop one strategy to enhance the physical resource, but to design a strategic decision approach to optimize the physical resource of organisations. This is important because every situation and project is unique, and it will be impossible to prescribe one "right way" to solve the problem. What is offered is a strategic, iterative decision-making process which can be used in order to address these issues within each context-dependent situation. This decision-making process is operationalized further by showing some tools which can be applied within the strategic decision approach.

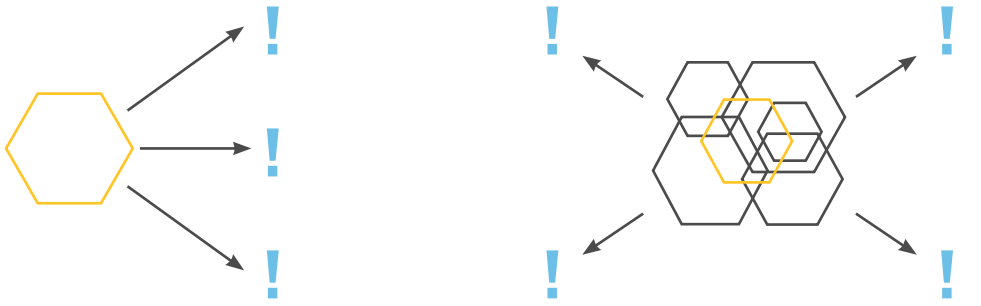


Figure 1.6.: *Research objective*

1.5. RESEARCH QUESTION

Derived out of the problem statement and the research objective, this graduation research strives to give answer to the following main research question:

How can 'Office as a Service' be a strategic decision approach for an organisation to optimize their physical resources in order to obtain maximum added value?

To answer the main research question this research has been divided in three parts: part A 'input', part B 'data collection' and part C 'output'.

Part A 'Input'

The first step in answering the main research question is elaborating on terms that are used in the problem statement, research objective and main research question. This research touches upon three relevant topics: Real Estate Management, Decison Support Systems and 'Office as a Service'. This determines the theoretical basis for the development of the strategic decision approach model:

- What theories and concepts apply to Real Estate Management?
- What theories and concepts apply to Decision Support Systems?
- What theories and concepts apply to 'Office as a Service'?

Part B 'Throughput'

The second part in answering the main research question will give answer to the main research question by developing the strategic decision approach model based on the theoretical input from part A:

- How to develop a strategic decison approach for 'Office as a Service'?
- How can decsion-making tools be evaluated?
- How is the strategic decision approach related to practice?

Part C 'Output'

The last part will explore whether the insights from part A and B can be generalized and transformed into a new tool that can be used for implementing 'Office as a Service' to optimize the physical resource in order to obtain maximum added value:

- How would a tool look like that can support the strategic decision apporach to incorporate 'Office as a Service'?

1.6. CONCEPTUAL MODEL

To clarify the different parts of this research, a conceptual model is made, see figure 1.7.. According to Miles and Huberman (1994), a conceptual model "explains, either graphically or in narrative form, the main thing to be studied and the presumed relationship among them". To clarify the conceptual model the different parts will be explained below.

The conceptual model is formed based on the main terms and concepts that are used in the main research question. In this main research question, six terms can be distinguished that can be related to each other:

How can 'Office as a Service' be a strategic decision approach for an organisation to optimize their physical resources in order to obtain maximum added value?

These six terms can be put into a triangle that illustrates the relationship between them. Three of the terms can be placed at the corners of the triangle: Organisation, Strategic decision approach and Real Estate. And three can be placed along the lengths of the triangle: Decision Support System, 'Office as a Service' and added value. The three terms at the corners of the triangle can then be related to the 'Golden Circle' thinking model developed by Sinek (2011). This model assumes three levels on which organisations and people operate: what you do (what, the outer ring), how do you do it (how) and why you do it (why, the core). In this triangle the terms are related in the following way:

- **Organisation - strategic decision approach:** Organisation (Why) and strategic decision approach (How) are related to each other by decision support systems that help organisations to come to a strategic decision approach.
- **Strategic decision approach - real estate:** Strategic decision approach (How) and real estate (What) are related to each other by the intervention of the implementation of an 'Office as a Service' concept.
- **Real estate - organisation:** Real estate (What) and organisation (Why) are related to each other by the presumed added value of real estate on the performance of an organisation.

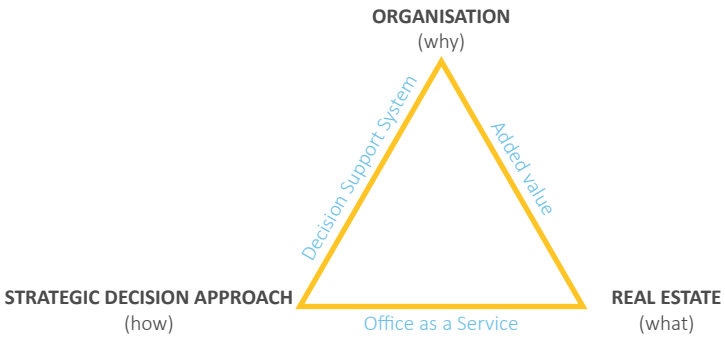


Figure 1.7.: *Conceptual model*

1.7. SCOPE DEFINITION

This research has the objective to develop and present knowledge on how the psychical resource can be enhanced by implementing 'Office as a Service' [§1.4]. This research builds upon multiple bodies of knowledge linked to the conceptual model: Real Estate Management, Decision Support Systems and 'Office as a Service' [§1.6]. The scope of these bodies of knowledge and clarification of the organisation perspective are described below and presented in a Venn diagram (figure 1.8.).

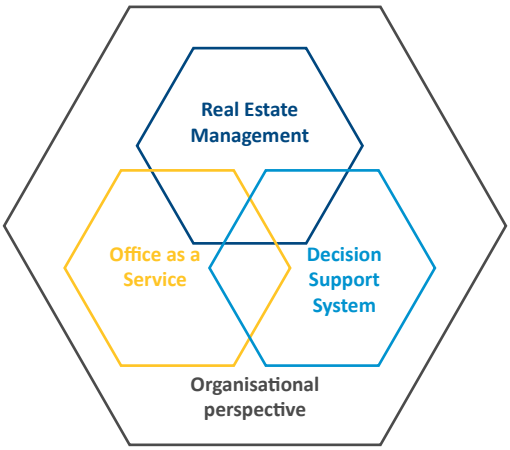


Figure 1.8.: Scope definition

Real Estate Management

Real Estate Management constitutes the overarching subject of this research. Therefore a comprehensive understanding of the theories, concepts, methods and possible applications is necessary. The literature study regarding Real Estate Management will mainly look into the presumed added value of real estate on performance of organisations and their different stakeholder perspectives [§3.2].

Decision Support Systems

A Decision Support System will be developed to facilitate the decision-making process for the implementation of an 'Office as a Service' concept. Therefore a comprehensive understanding of the theories, concepts and possible applications is necessary. The literature study regarding Decision Support Systems will mainly look into the concept of a Multi-Criteria Decision Analysis model [§3.3].

Office as a Service

The implementation of an 'Office as a Service' concept constitutes the possible intervention to enhance the physical resource in order to obtain maximum added value. Therefore a comprehensive understanding of the theories, concepts and possible applications is necessary. The literature study regarding 'Office as a Service' will mainly look into the supply side of 'Office as a Service' and their relationship according to the presumed added value of real estate on performance of organisations [§3.4].

Organization perspective

The relationship between supply and demand is also present within 'Office as a Service'. As shown in figure 1.9., three perspectives can be distinguished. The first one is the perspective of the supplier/operator of an 'Office as a Service' concept. Examples are companies such as WeWork, Spaces or Regus. The second perspective is the one of the user of an 'Office as a Service' concept. Here you can think of any user with a demand for flexible office space: from freelancer up to a multinational. However, this graduation research will make use of the third perspective: that of the user/supplier of an 'Office as a Service' concept. This is an occupier organisation who implements an 'Office as a Service' concept within their own portfolio and is both supplier and user of this concept.

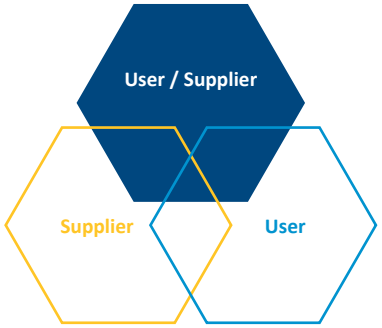


Figure 1.9.: Office as a Service perspective

1.8. RELEVANCE

The relevance of this graduation research can understood in terms of its societal, scientific and sector-specific relevance. All are discussed in the following paragraphs.

1.8.1. SOCIAL RELEVANCE

The societal relevance of this graduation research can be found in the citation of Hans de Jonge: "Accommodate the future demand in existing stock" (Arkesteijn, Van der Voordt, Remoy, Chen, & Curvelo Magdaniel, 2016). As described in the problem statement [§1.3] the relationship between supply and demand is constantly changing with a resulting mismatch between what the building can offer and what the organisation requires and therefore an underutilization of space. With the implementation of an 'Office as a Service' concept within this underutilized space, an optimization of the existing stock can be made and with this optimization a reduced demand for newly-build supply, also quoted by Alex Edds (Rudra, 2016). This optimization has multiple positive effects. First that the demand for new raw materials will decrease due to the decrease of new demand. Second, it will also help to reduce the pollution of the commuter traveller as they are able to work at multiple locations without the need of travelling to their own office. A research by Regus (2018) shows that flexible working may reduce the levels of carbon dioxide emissions by 214 million tonnes per year by 2030. The amount of carbon dioxide saved by this reduction is equivalent to the amount of carbon sequestered by 5.5 billion trees over ten years. If the growth for flexible working continues, 3,53 billion hours of commuting could be saved every year by 2030. At last, Consultancy Europe Economics (2016) has estimated the potential welfare gain from reductions in the underutilization of assets and labour across the EU at €572 billion, which translates to over €1.000 per EU citizen (Zuluaga, 2016).

"If we use space more efficiently, by sharing our spaces, we'll need less space overall - which potentially means less new construction and new developments." Alex Edds

1.8.2. SCIENTIFIC RELEVANCE

The scientific relevance of this graduation research can be found in combining the three topics from the problem statement [§1.3] and the main research question [§1.5]: (Corporate/Public) Real Estate Management, Decision Support Systems and 'Office as a Service'. Within scientific research all three topics are discussed. However, as mentioned by Van de Kar et al. (2017) serviced and coworking offices have surfaced more recently and so far scientific research on these concepts still remains scarce. This results in a gap in literature when all three topics are related with each other to see what the role of ''Office as a Service'' can be within Real Estate Management and how this can be translated in a strategic decision model. This observation is supported by Jones (2018) who believes that it is time for academic researchers to play their part in terms of generating actionable research to help companies in their ongoing decision making processes.

"Now that coworking has proven to be a real thing, it is time for academic researchers to play their part in terms of generating actionable research to help companies in their ongoing decision making processes regarding their workplace strategies." Drew Jones

In addition, this graduation research will contribute to the goals and objectives of the department of Real Estate Management of the apartment of Management in the Built Environment, within the faculty of Architecture and the Built Environment at the Delft University of Technology (Arkesteijn e.a., 2016). The contribution to the following goals and objectives can be mentioned:

- Identification of probable, possible and desirable real estate interventions to create the best possible match between supply and demand.
- Ways to add value by real estate to organisations, individuals and society as a whole.
- Ways to cope with vacancy and dynamics in the demand for real estate.
- Theories and empirical evidence on how design, implement, monitor and adapt succesful accommodation strategies, performance measurement and management, and adding value by corporate and public real estate.
- Tools to support innovative and evidence-based multi-actor decision-making by clients, developers, investors, architects, engineers, consultants, policy makers, product developers, contractors and end users in planning, briefing, design, management and use of the built environment.

1.8.3. SECTOR RELEVANCE

The sector relevance of this graduation research will be related to the four performance criteria defined by De Vries (2007) and Den Heijer (2011): Competitive advantage, profitability, productivity and sustainability. With the development of a strategic decision approach a strategic, iterative decision-making model will help organisations to decide which form of 'Office as a Service' can help them to align their real estate to their core business in order to obtain maximum added value for the business and to contribute optimally to the overall performance of the organization.

"The biggest shift we see in the coming years is that flexible workspace will become a key component of many companies' workplace and real estate strategies - for occupiers and building owners alike. "
Peter Black

As mentioned by Peter Black (2017), flexible office workspace will become a key component of many companies' workplace and real estate strategies. Flexible workspace is not just for millennial freelancers or tech start-ups anymore. Large, multinational companies are increasingly taking on space at flexible workspace operators or integrating shared workspaces into their own environments.

This growth in flexible office workspace is supported by research conducted by multiple companies like CBRE, Colliers and JLL. JLL shows that in 2017 alone, the total amount of flexible space in the top 20 largest flex markets globally grew by 30% - equivalent to around 1 million square meters. Since 2014, the market has doubled, and in leading cities such as London, it now represents around one fifth of the take-up.

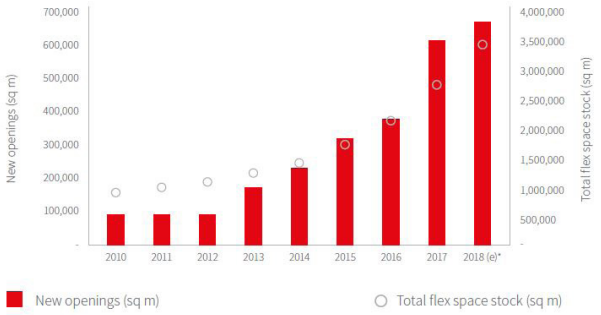


Figure 1.10.: *Flexible space growth 2010-2018 (JLL, 2018)*

When looking into the future, the growing demand for flexible office will not come to an end. Both in research by JLL (2018) and Harrisson (2018) companies were asked to forecast their use of flex space in the next three to five years. This resulted in conservative companies anticipating that their use will remain at under 5%, a next group anticipates to use as much as 20%-35% with some suggesting further still. JLL predicts that up to 30% of CRE will be consumed as flexible by the year 2030 (JLL, 2018). This type of growth would represent a dramatic recasting of corporate real estate portfolios and even under a super-conservative base case, a minimum of 5% of corporate portfolios represents a significant requirement in overall space terms.

"In many respects we are still in the early days of coworking's maturity as both an industry and as a new work location for corporate employees. Firms that develop a clear coworking strategy that can move beyond the hype of coworking and leverage it to add value in new and innovative ways."
Andrew Jones

Having 'crossed the chasm' from trend to mainstream adoption, Andrew Jones (2018) suggests that it is time for firms to take coworking seriously, as an industry, and to develop a clear strategy for how to embrace it and leverage it as an opportunity to transform their companies. The challenge falls initially on corporate real estate (CRE) and human resource (HR) professionals, but the challenge and opportunity should also be tackled across the firm. Firms that develop a clear coworking strategy can move beyond the hype of coworking and leverage it to add value in new and innovative ways.


life.

RESEARCH METHODOLOGY

2

2. RESEARCH METHODOLOGY

The research proposal is presented in chapter 1. This chapter presents and underpins the chosen research methodologies for the research project and provides insight into the chosen structure of this graduation research.

2.1. RESEARCH TYPE

In general two types of 'inquiry models' can be distinguished: quantitative and qualitative research. Due to the fact that the aim of this graduation research is to explore how the physical resource can be enhanced by implementing 'Office as a Service' to align real estate to the needs of the core business, in order to obtain maximum added value for the business and contribute optimally to the overall performance of the organization, this research is about the generation of new theories. Therefore a qualitative research is more appropriate (Bryman, 2012; Kumar, 2010). In addition, part B 'Data collection' has with its three sub-questions a more explorative character. An explorative research is "(...) undertaken with the objective (...) to explore an area where little is known about. (...) Explorative researches area also conducted to develop (...) tools and procedures" (Kumar, 2010). This type of research is appropriate there this graduation research relates to developing a new instrument.

	OPERATION RESEARCH	EMPIRICAL RESEARCH
TYPE	Operation-related	Knowledge-related
AIM	Creating an artefact Changing situations	Producing knowledge Formulating explanations
RELEVANCE	Operational	Theoretical
SUBJECT	Future	Past
GOAL	Improvement	Understanding
METHODOLOGY	Prescriptive	Descriptive
SCIENCE	Formal sciences	Empirical sciences

Table 2.1.: *Distinction between operations research and empirical research (Barendse et al., 2012)*

Looking at the main research question of this graduation research and taking into account table 2.1. by Barendse et al. (2012) the main research question relates to the operation-related problems as it uses the "How can ..." type of question. Together with the fact that it strives to create an artefact in order to change the situation that is currently occurring, it has an operational relevance that aims to improve the future situation by using a prescriptive methodology. According to Barendse et al. (2012) the main research question therefore needs to be answered by using the design cycle. A structure for such a process is shown in figure 2.1.. It shows an iterative process towards the development of an artefact that is based on the five stages of an operations research by Ackoff and Sasieni (1968) but in a more extensive and detailed form. Each of these stages comprises of a set of tasks that are performed using the provided input. This input however, needs to be obtained in an empirical way.

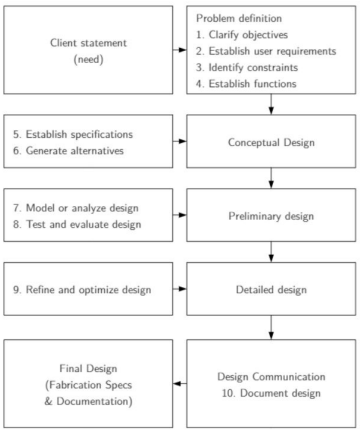


Figure 2.1.: *Steps of design process (Dym & Little, 2004, p.24)*

As a result, it becomes clear that using only an operational research (formal) or solely an empirical research approach is not sufficient enough to solve the identified problem and to answer the main research question. Therefore the best approach is to use a hybrid research method, which combines the characteristics of both empirical and operation research. This hybrid research method is developed by Barendse et al. (2012) and presents the interrelationship between the two research methods. Both research processes are cyclical, creating two iterative loops. The loops visible in figure 2.2. are linked in four points.

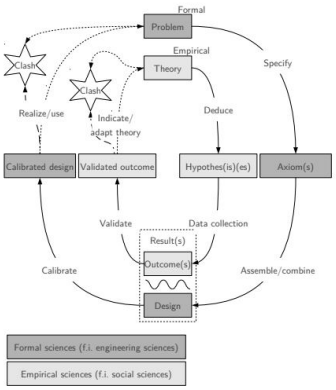


Figure 2.2.: *Engineering and social sciences (Barendse et al., 2012)*

2.2. RESEARCH DESIGN

In order to answer the main research question several research 'steps' are needed. The approach of this research consists of nine more or less consecutive steps, within three iterative loops. Figure 2.3. shows the design with all the steps and their relation and is based on the design research cycles of Hevner and Chatterjee (2010).

The nine steps undertaken for this research are:

- Step 1: Determination of the context [§1.1.];
- Step 2: Problem definition and research objective [§1.3., §1.4.];
- Step 3: Literate study [§2.2.1.];
- Step 4: Conceptual design of the 'strategic approach' [§2.2.2.];
- Step 5: Interviews [§2.2.3.];
- Step 6: Preliminary design of the 'strategic design' [§2.2.4.];
- Step 7: Verification and validation of the preliminary design [§2.2.5.];
- Step 8: Detailed design of the 'strategic approach' [§2.2.6];
- Step 9: Conclusions, discussion and recommendations for further research [§2.2.7.];

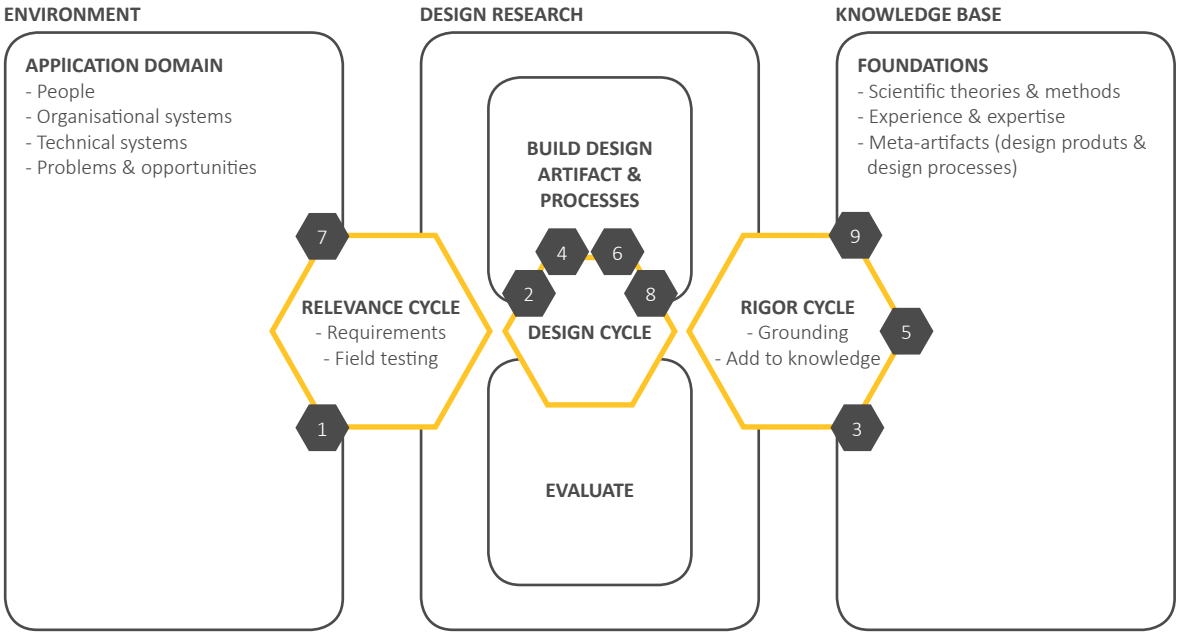


Figure 2.3.: *Indication of the research steps in Hevner's design research cycle (Own ill. based on Hevner & Chatterjee, 2010)*

The results of step 1 and 2 (determination of the context, problem definition and research objective) have been presented in §1.1, §1.3 and §1.4 and do not require further description. The research method approach to the remaining 7 steps are described in detail in the remainder of this chapter.

LITERATURE RESEARCH

3

CONTEXT

1

Changing demand

Changing supply

PROBLEM DEFINITION & RESEARCH OBJECTIVE

2

Mismatch Demand-Supply

Strategic approach

Study 1

Real Estate Management

Study 2

Decision Support Systems

Study 3

Office as a Service

CONCEPTUAL DESIGN

4

INTERVIEWS

5

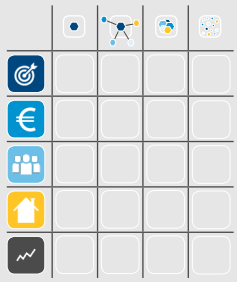
Added values & KPI's

Office as a Service strategies

Relationship why & what

PRELIMINARY DESIGN

6



COMPARTIVE CASE STUDIES

7

ING

Microsoft

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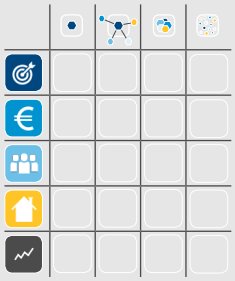
DETAILED DESIGN

8



CONCLUSION, DISCUSSION AND RECOMMENDATIONS FOR FURTHER RESEARCH

9

Conclusion

Discussion

Recommendations

2.2.1. LITERATURE STUDY

A literature review is used to form a basis of knowledge regarding the important topics of this graduation research. Reviewing literature helps to identify what is already known about the topic. It looks into what concepts, theories and methods have been applied to the topic, what research methods have been applied to the topic, what controversies exist about the topic and how it is studied, what clashes of evidence exist, and who the key contributors to research on the topic are (Bryman, 2012, p.8).

The research exists of one round of literature studies, displayed as step 3 in the research design (figure 2.3.). Step 3 consist of studies 1, 2 and 3 which look into the three relevant topics of this graduation research:

- *Study 1*: Real Estate Management. A study to identify the presumed added value of real estate on the performance of organisations and their different stakeholder perspectives [§3.2].
- *Study 2*: Decision Support Systems. A study into the available Decision Support Systems to use as an underlayer for the development of the 'strategic decision approach' [§3.3].
- *Study 3*: Office as a Service. A study into the supply side of 'Office as a Service' and their relationship according to the presumed added value of real estate on performance of organisations [§3.4].

These outcomes are used as input to establish the conceptual design of the 'strategic decision approach' [§2.2.2., step 4]. Subsequently, this conceptual design was verified and improved by interviewees [§2.2.3., step 5] and a cross-case study [§2.2.5., step 7].

2.2.2. CONCEPTUAL DESIGN

Step 4, The development of the conceptual design of the 'strategic decision approach' is the result of the integration of study 1, 2 and 3 [§2.2.1, step 3]. It consists of a matrix indicating the demand variables that affect the presumed added value of Real Estate [horizontal axis] per type of 'Office as a Service' strategy [vertical axis]. The first conceptual design of the 'strategic decision approach' is depicted in chapter 4.

2.2.3. INTERVIEWS

The development of the conceptual design of the 'strategic decision approach' has been followed by an interview process. An explorative, open-ended, semi-structured interview approach was chosen to provide guidance during the interviews and to obtain similar structured data from each interview. The goal of the interview process was to verify, supplement and refine the first conceptual design of the 'strategic decision approach', which is based on literature research. In this section, the method of data gathering, the selection process of the interviewees and method for data analysis are elaborated.

Data gathering

The first objective of the interview process was to roughly verify the first matrix framework. This verification approach was chosen to identify and correct major and obvious errors in the framework before testing it with real-life cases. Verification, supplementation and refinement of the 'strategic decision approach' were achieved by the following steps:

- Verification, supplementation and refinement of the list of Key Performance Indicators related to the presumed added value of real estate on performance of organisations [§5.2.1.].
- Verification, supplementation and refinement of the list of 'Office as a Service' strategies and 'Office as a Service' products [§5.2.2].
- Verification, supplementation and refinement of the relationship between the presumed added value and KPI's (why) with the 'Office as a Service' strategies and 'Office as a Service' solutions (what) [§5.2.3.].

Selection of interviewees

Stakeholders that are related to the topic of 'Office as a Service' can be placed in a triangle related to demand-supply. On the one hand the occupier who represents the demand side, on the other hand the market who represents the supply side, and finally the consultant who marks the connection between demand and supply. For the research design both sides are taken into account. For the selection of interviewees both the consultants and the market parties are selected to verify, supplement and refine the conceptual design of the 'strategic decision approach', after which a case study round takes place with the occupier (demand side).

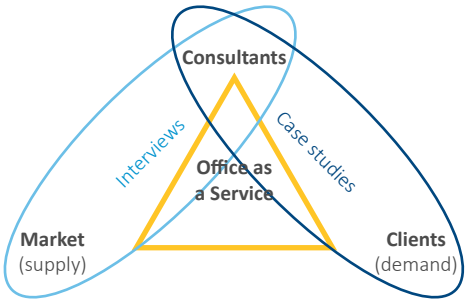


Figure 2.4.: Selection of interviewees

Data analyses

The responses of the interviewees were recorded and summarized. These summaries were sent back to the interviewees for verification to minimize any possible misinterpretation.

2.2.4. PRELIMINARY DESIGN

The preliminary design of the 'strategic decision approach' [step 6] is the result of the integration between the literature research [step 3] and the data gathered from the interviews [step 5] with the conceptual design of the 'strategic decision approach' [step 4].

2.2.5. CASE STUDY

The development of the preliminary design of the 'strategic decision approach' is followed by a case study round. The reason to choose case studies to be part of the research process is that this research opts to solve real-life problems. It is therefore important to link this research with real practice. The following sections will elaborate on the case study selection and data analysis.

Selection of case studies

Following Bryman (2012) case selection in qualitative research exists of two levels, selecting the context and selecting the participants. Selecting the cases will be done by means of purposive sampling. Purposive sampling is a strategic way of selecting (Bryman, 2012, p.410). In line with the concepts of the conceptual model, the following selection criteria are used:

- The organisation is a private organisation
- The organisation has undergone a strategic decision process about the implementation of an Office as Service strategy.
- The four Office as a Service strategies are present

Based on these selection criteria the following three case studies are selected and presented in table 2.2..

Case	Office	Company	Location
1.	Campus	ING	Amsterdam
2.	The Outlook	Microsoft	Amsterdam
3.	The Cloud	Uber	Amsterdam

Table 2.2.: Seleciton of case studies

Data analysis

The case studies are analysed using a so-called cross-sectional case study design (Bryman, 2012; Yin, 2014). While analysing the case studies, the derived information is linked to the preliminary design of the 'strategic decision approach'. The different case studies are seen as individual research studies. The analytical design consists of two types of analyses: an in-case analyses per case study and an 'overall' cross-case analysis covering all three case studies.

The in-case analysis was made first, the aim of these analysis is gaining data from the case studies. Hereby the focus lays on the intended demand, both added values and occupier space demand, the chosen 'Office as a Service' strategy in relation to the Core-Periphery model of Gibson and Lizieri (1999) and the relationship between demand and supply.

A cross-case analysis was made after the in-case analysis. This cross-case analysis aims to identify similarities and differences between the cases, hereby a pattern matching technique is used (Eisenhardt, 1989; Yin, 2014).

2.2.6. DETAILED DESIGN

The detailed design of the 'strategic decision approach' [step 9] is the result of the integration of the data out of the literature study of step 3, the interviews of step 5 and the cross-case study of step 7 with the preliminary design of the 'strategic decision approach' [step 6].

2.2.7. CONCLUSION, DISCUSSION AND RECOMMENDATIONS

The conclusions of the research (chapter 7) provide answer to the sub-questions leading to the answering of the main research question [§1.5]. In chapter 7 the research results are discussed and recommendations for furhter research are made in chapter 8.

LITERATURE STUDY

3

3. LITERATURE STUDY

This chapter presents the literature study that forms the basis for the research conducted in the next chapters. Therefore an overview of the existing theories and bodies of knowledge related to the research topics will be given. As such, literature about Real Estate Management, 'Office as a Service' and Decision Support Systems are reviewed.

3.1. LITERATURE REVIEW

A literature review is used to form a basis of knowledge about the important topics of this graduation research. Reviewing literature helps to identify what is already known about the topics, what concepts, theories and methods have been applied to the topic, what research methods have been applied to the topic, what controversies exist about the topic and how it is studied, what clashes of evidence exist, and who the key contributors to research on the topic are (Bryman, 2012, p.8). This literature review is structured in line with the 'Golden Circle' model by Sinek (2011):

- *Why - Real Estate Management:* A study to identify the presumed added value of real estate on performance of organisations and their different stakeholder perspectives [§3.2].
- *How- Decision Support Systems:* A study into the available Decision Support Systems to use as an underlayer for the development of the 'strategic decision approach'[§3.3].
- *What - Office as a Service:* A study into the supply side of 'Office as a Service' and their relationship according to the presumed added value of real estate on performance of organisations [§3.4].

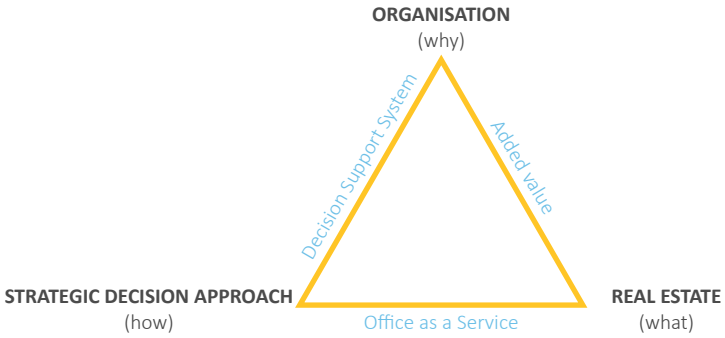


Figure 3.1..: *Literature study*

3.2. REAL ESTATE MANAGEMENT

Real Estate Management constitutes the overarching subject of this research. Therefore, a comprehensive understanding of the theories, concepts, methods and possible applications is necessary. First the theories on the relationship between real estate interventions and performance (added value) will be discussed and afterwards the theories on corporate and public real estate management are explained.

3.2.1. IMPACT REAL ESTATE ON PERFORMANCE

The basis of real estate management is the presumed added value of real estate on performance, either negative or positive. If real estate had no impact on performance, no society, organisation or individual would spend resources on it. 'Performance' refers to more than only financial results and goals. It could also refer to achieving social goals such as the happiness and well-being of individuals, the goals of non-profit organisations or environmental goals of society.

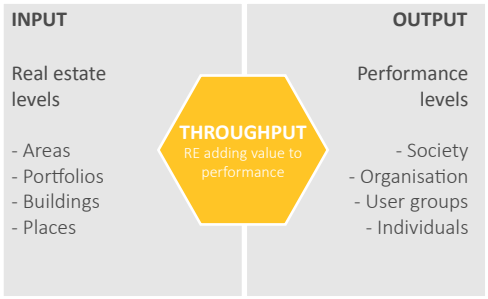


Figure 3.2.: Basis of real estate management: real estate adding value to performance (Den Heijer, 2011)

3.2.2. IMPACT REAL ESTATE ON ORGANISATION

So, if real estate has an impact on performance, how does this relate to an organisation? Corporate Real Estate (CRE) is often referred to as the fifth resource (De Jonge, 1996; Joroff, Lambert, & Louargand, 1993; Krumm, 1999) that cannot be isolated from the other four: 1. capital, 2. human resources, 3. information and 4. technology. In contributing to organisational performance real estate is just one of the five resources potentially adding value. De Vries (2007) combines this in a theoretical model of an organisation (figure 3.3.) in which she links input to output & processes and output to performance: productivity, profitability and competitive advantage.

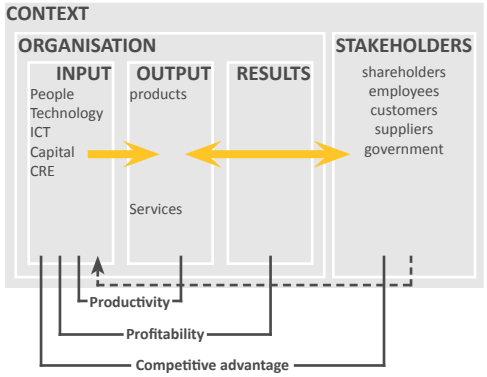


Figure 3.3.: Theoretical model of an organisation (De Vries, 2007)

As the fifth resource, De Vries (2007) distinguishes ten ways in which real estate can contribute to organisational goals, elaborating on the list of seven value parameters defined by De Jonge (1996) and linking them directly or indirectly to three performance criteria: profitability, productivity and competitive advantage. Resulting from this are ten interrelated ways of adding value, also called real estate goals or objectives. Den Heijer (2011) merged these together with insights from other sources and adds a new performance criteria: sustainable development. She illustrated this as can be depicted in figure 3.4..

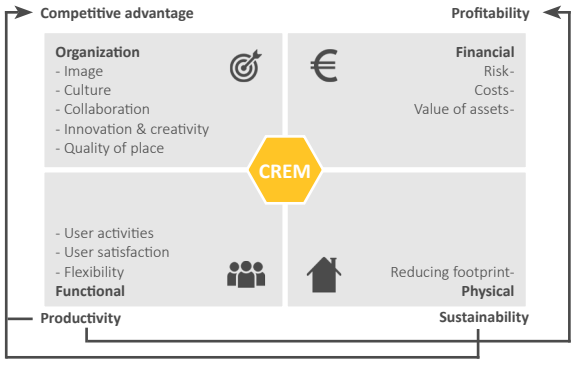


Figure 3.4.: Model to asses added value of real estate decisions (Den Heijer, 2011)

3.3.3. ADDED VALUE

Using the objective by Dewulf, De Jonge and Krumm (2000), a corporate real estate manager should focus on adding value to the organisation. De Vries (2007) and Den Heijer (2011) defined the added value of real estate as the contribution of real estate to organisational performance and the attainment of organisational objectives from the point of view of different stakeholders. Jensen & Van der Voordt et al. (2012) define added value as "the trade-off between the benefits and the costs and risks to achieve these benefits".

Over the years different types of added value have been presented and assessed by a review of literature, analysis of documents and interviewing relevant stakeholders. De Jonge (1996) started with a list of seven value parameters. De Vries (2007) extended the list by adding 'increasing employee satisfaction' as another possible added value of CRE. Den Heijer (2011) added sustainability to the list and split and/or renamed various other value parameters, coming up with a list of 14 different added values. Riratanaphong (2014) and Van der Zwart (2014) compared various lists of value parameters and in the end defined their own lists as well.

The lists of ways to add value with Corporate Real Estate can be understood as changing over time. So far, there is no consensus about which parameters are key and which terms represent various value parameters as most appropriate. Based on a sound comparison of many lists, Jensen & Van der Voordt (2016) analysed all lists so far and devised a list of 12 parameters. For this research the most recent list of Valks, Arkesteijn and Den Heijer (2018) is used which takes thirteen added values into account.

Nourse and Roulac	De Jonge	Lindholm & Levänen	Scheffer et al.	De Vries	Den Heijer	Jensen & Van der Voordt	Valks, Arkesteijn, Den Heijer
1993	1997	2006	2006	2007	2011	2016	2018
Occupancy cost minimization	Reduce cost	Reduce cost	Cost reduction	Cost reduction	Decreasing costs	Cost	Decreasing costs
Facilitatea and control production, operations and service delivery	Improve productivity	Increase productivity	Increasing productivity	Increase productivity	Support user activities	Productivity	Support user activities
	Improve culture	Increase employee satisfaction		Increasing satisfaction	Increasing user satisfaction	Satisfaction	Increasing (user) satisfaction
					Improving quality of place	Health and safety	Improving qualtiy of place
Promote human resource objectives	Improve culture		Changing culture	Improving culture	Supporting culture	Culture	Supporting culture
Facilitate mana-gerial process and knowledge work					Simulating collaboration	Innovation and creativity	Simulating collaboration
		Increase innovation		Stimulating innovation	Stimulating innovation		Stimulating innovation
Promote marketing message	Marketing	Promote marketing and sale	PR and marketing	Supporting image	Supporting image	Image	Supporting image
						C.S.R.	
Flexibility	Increase flexibility	Increase flexibility	Increase flexibility	Enhancing flexibility	Increase flexibility	Adaptability	Increasing flexibility
Capture real estate value creation	Improve availabity of finance	Increase value of assets	Increase of value	Expanding funding possibilties	Increase real estate value	Value of assets	Increase real estate value
	Risk management		Risk control	Controlling risk	Controlling risk	Risk	Controlling risk
					Reducing ecological footprint	Sustainability	Reducing footprint (m2)
							Reducing footprint (CO2)

Table 3.1.: *Added value of real estate based on different literature*

The thirteen added values as derived from the research of Valks, Arkesteijn and Den Heijer (2018) are explained in short to make clear where they refer to:

- *Decreasing cost:* These 'costs' are not (just) referring to real estate costs, but could also refer to overall costs or personnel costs. When a new concept adds to higher production or a lower percentage of absence, decreasing costs can be achieved by a variety of real estate interventions.
- *Support user activities:* Optimally supporting the activities of users is usually aimed at increasing production – adding to the productivity of the organisation – but it can also be used to satisfy the users and make them more loyal to the organisation, or preventing them from changing employer or moving to organisations with better facilities.
- *Increasing (user) satisfaction:* Some real estate interventions are exclusively aimed at increasing user satisfaction – adding quality or facilities to the workplace, quickly responding to their changing demands or choosing locations that are favourable to the user.
- *Improving quality of place:* All real estate interventions that aim to satisfy the users and add to the competitive advantage of the organisations in attracting and retaining employees, and to add to the image of the organisation for incidental or frequent visitors.
- *Supporting culture:* Closely related to 'supporting image' this is more related to the internal users: building community or stimulating interaction between certain user groups.
- *Stimulating collaboration:* This includes all real estate interventions that stimulate encounters between different users or user groups, aligning with organisational goals to work on cross-disciple products, both within buildings and between buildings.
- *Simulating innovation:* 'Innovation' in primary processes can be achieved by stimulating planned and unplanned encounters between users – combining 'stimulating collaboration', 'supporting culture' and interventions that create places to meet, scheduled or accidentally – adding to 'serendipity', unintentionally making discoveries or finding new solutions by the interference of others.
- *Supporting image:* This involves all real estate interventions that suppot the image of the current users or the external parties – or potential employees, customers or clients.
- *Increasing flexibility:* This is related to controlling risks that concerns financial flexibility or the flexible use of facilities by many types of users that enable an organisation to solve a problem in the real estate portfolio without hindering their primary processes.
- *Increase real estate value:* All real estate interventions that aim at resulting in a higher potential (market) value of land and building.
- *Controlling risk:* This can mean controlling financial risks, it can also mean controlling technical and functional risks by carefully monitoring the technical condition to make sure primary processes are not hindered.
- *Reducing footprint (m²):* Is the way that real estate interventions lead to a reduction of m² or optimal use of m².
- *Reducing footprint (CO^2):* Sustainable interventions in real estate in order to reduce CO^2 emissions. This is more and more important for organisations, due to the Climate Agreement of Paris.

Thirteen added values, but for whom? Over the years Corporate Real Estate Management theory (De Jonge, 1996; Krumm, 1999) elaborated on the different stakeholders perspectives to connect, distinguishing four quarters: either focusing on institution (demand side) or real estate (supply side) on the horizontal axis and either focusing on strategic or operational level on the vertical axis. Based on the CREM model, Den Heijer (2011) developed a conceptual model that identifies four perspectives of stakeholders: the organizational perspective of stakeholders, the financial perspective of the controllers, the functional perspective of the end users, and the spatial-technical perspective of the property managers and technical specialists. Within these four perspectives there can be zoomed into smaller scales such as business units and departments, and zoomed out to larger scales like the society as a whole, local and regional. Next tot that, a division can be made between internal and external stakeholders.

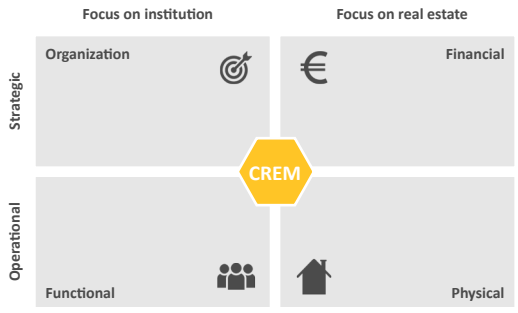


Figure 3.5.: *Stakeholder perspectives (Den Heijer, 2016)*

3.2.4. CONCLUSION REAL ESTATE MANAGEMENT

This sub-chapter helps in providing an answer to the sub-question: What theories and concepts apply to Real Estate Management?

The basis of real estate management is the presumed added value of real estate on performance, either negative or positive. Referred to as the fifth resource for an organisation, real estate has thirteen objectives through which the physical resources can add value to the organisation. Based on the Corporate Real Estate Management model, these thirteen presumed added values can be divided over the four perspectives of stakeholders which all serve different performance criteria.

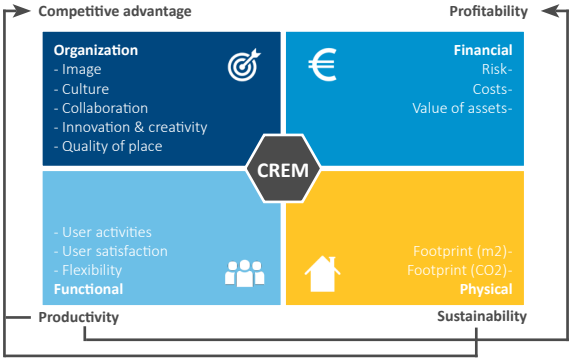


Figure 3.6.: Conclusion Real Estate Management (Own ill. based on (Valk, Arkesteijn, Den Heier, 2018)).

3.3. DECISION SUPPORT SYSTEM

A Decision Support System (DSS) is developed to facilitate the decision-making process for the implementation of an 'Office as a Service' concept. Therefore this chapter introduces the concept of Multi-Criteria Decision Analysis (MCDA).

3.3.1. Multi-Criteria Decision Analysis

Multi-Criteria Decision Analysis (MCDA), according to Belton and Stewart (2002, p. 2), is defined as "an umbrella term to describe a collection of formal approaches which seek to take explicit account of multiple criteria in helping individuals or groups explore decisions that matter". MCDA can be applied when decisions have to be made which involve a number of criteria that have an influence on the outcome. It is used especially when conflicting objectives occur, either from one stakeholder, or from various stakeholders.

As mentioned in the research objective [§1.4], the objective of a corporate real estate manager is the alignment of the real estate portfolio of an organisation to the needs of the core business, in order to obtain maximum added value for the business and to contribute optimally to the overall performance of the organization. Where, as mentioned in the previous sub-chapter Real Estate Management [§3.2], thirteen different added values can be differentiated and divided over four stakeholder perspectives.

This research helps to answer the question that deals with the decision making process how 'Office as a Service' can be a strategic decision approach for an organisation to optimize their physical resources in order to obtain maximum added value. Since deciding results in making a choice in an 'Office as a Service' strategy and the added values help in reflecting the interests of the stakeholders, it seems reasonable to expect, that MCDA approaches can help to solve one of the biggest challenges in Corporate Real Estate Management. Which is reducing the gap between the high speed of business and the slow speed of real estate, i.e. between the so-called dynamic real estate demand and relatively static real estate supply.

3.3.1.1 Multi-Criteria Decision Analysis procedure

The MCDA process is an iterative process and can be divided into three main phases:

- Phase 1: Problem identification and structuring;
- Phase 2: Model building and use;
- Phase 3: Development of plan of a plan of actions.

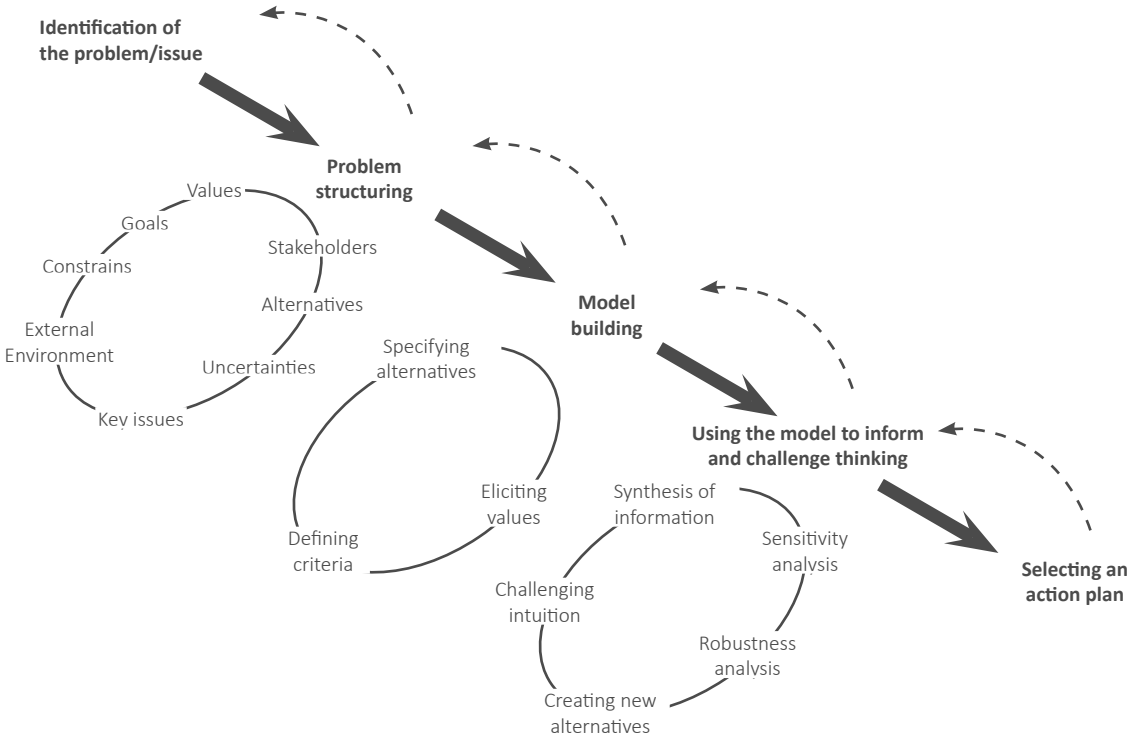


Figure 3.7.: MCDA process (Own ill. based on (Belton & Stewart, 2002)).

The formal procedure of MCDA consists of five steps (Binnekamp, 2010):

- Specification of alternatives
- Defining the decision-makers criteria tree
- Rating of the decision-maker preferences for each alternative in relation to each criterion
- Assigning the decision-maker weight to each criterion
- Using an algorithm to draw an overall preference scale.

The procedure for a group of decision makers is identical to the procedure for a single decision maker. With the exception that each decision maker has to rate his preference for the alternatives on each criterion.

By using the weights in the process, the relative importance of each criterion and the relative significance of the decision-makers can be included. Applying an algorithm considering rating each alternative's performance on each criterion and criteria relative weight, the overall performance of an alternative can be determined (Binnekamp, 2010).

It is crucial to realize that the MCDA outcome only reflects the decision established on the basis of the criteria and the weights listed by the decision makers themselves.

Weight vs. measurement units

Those concepts can be summarized and used in this research in the following way:

- *Weights:* which are relative measurements, expressing the importance of criteria. They are used in an 'intra-criteria' way, which means that it tells how the relevance of different criteria is changing. Weights can also be applied to objectives, expressing focal points and giving them order; or decision makers, giving some of the decision makers more decision power than others.
- *Values:* which are assigned 'intra-criteria', and are bound with alternatives. Values are assigned as characteristics of the alternatives connected to one specific criterion.
- *Preferences:* are used as the unit used for rating the alternatives. They are also known as utility, value and are non-physical variables that describe a psychological or subjective property of an object (Barzilai, 2010, pp. 1, 25). Ratings are given by a person evaluating the performance of each alternative against a specific criterion.

3.2. CONCLUSION DECISION SUPPORT SYSTEM

This sub-chapter helps in providing answer to the sub-question: What theories and concepts apply to Decision Support Systems?

Decision-making in the field of (corporate) real estate management requires multiple objectives. They are often conflicting and come from stakeholders driven by various goals. For this reason, the concept of Multi-Criteria Decision Analysis is introduced to support the decision-making process by taking explicit account of multiple criteria to make the most suitable decision. With this approach, the alternatives are assessed against the defined criteria set to choose the most suitable. They make use of weights, rates and preferences to come to the optimal solution.

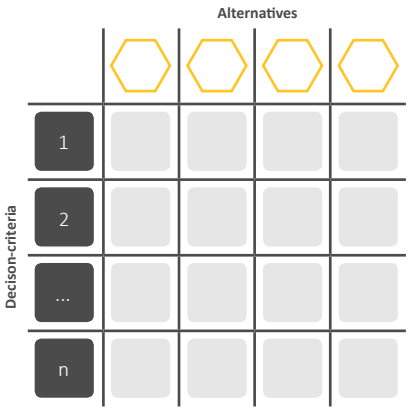


Figure 3.8.: *Conclusion Decision Support System*

3.4. OFFICE AS A SERVICE

The implementation of 'Office as a Service' constitutes the possible interventions to enhance the physical resource in order to obtain maximum added value. Therefore a comprehensive understanding of the theories and concepts, methods and possible applications is necessary. First the underlaying theories on 'servitization' and 'Product-Service-Systems' are discussed and thereafter is explained how these theories are related to the product 'real estate'.

3.4.1. SERVITIZATION

Servitization is the process of adding services to products. Already in 1988 Vandermerwe and Rada (1988) mention this concept, hereby mentioning that: "Modern corporations are offering fuller market packages or 'bundles' of customer-focused combinations of goods, services, support, self-service, and knowledge. But services beginning to dominate" (Vandermerwe & Rada, 1988, p.314). Servitization fits according to Mont (2002) in the wider trends of the shift towards a 'service economy'. This kind of economy is defined as a "(...) service-oriented model of manufacturing growth has key competitive factors such as capability for continuous innovation, improved design and quality and customised goods, rather than the production of large volumes of standardised products" (Mont, 2002, p.238).

3.4.2. PRODUCT-SERVICE-SYSTEM

If a service is connected to a certain product, a Product-Service-System (PSS) could be created, this PPS is hereby an integrated combination of a product and a service that delivers value in use (Baines, Lightfoot, Benedettini, & Kay, 2009). Goedkoop et al. (1999) give a definition of the Product-Service-System. They state that the Product-Service-System is "a marketable set of products and services capable of jointly fulfilling a user's need. The concept of "product as services" was introduced by Walter Stahel in 1989. He advocated a service society, whereby the value of utilization was at the heart of the economy. This advocates a performance drive orientation, where the user pays for utilisation of a product. The objective of this functional economy is to "create the highest possible use value for the longest possible time while consuming as few material resources and energy as possible" (O. Mont, 2002).

Stahel (2008) summarized the main ideas of selling of 'products as services' as follows:

- The object of sale is the performance and not the product itself, the customer satisfaction is the end-result.
- Liability of the quality of the overall performance remains at the seller (the service provider or service supplier, red)
- Payment is done when the performance is delivered and is based on the quality of the delivered service, and not at the moment when products are transferred.
- Service has to be provided in situ, instead of produced centrally.
- The property rights and related liability remains at the service provider and are not transferred to the buyer.
- Customer service is used as marketing strategy, instead of using publicity and sponsoring.
- Value is delivered over the long-term utilization period instead of short-term exchange value at the point of sale.

3.4.3. OFFICE AS A SERVICE

Servitization could be introduced within the public or corporate real estate sector with the implementation of a Product-Service-System. A servitized public or corporate real estate sector should offer products that allow supplying parties to offer a performance or a service towards the customer. Since the customer will pay for this product, the service provided with it should yield a certain degree of utility (i.e. a performance) for the user. Hereby De Grauw (2015) defines performance as: "A performance is an agreed upon action of performing that results in an output, utility, goal, function or commitment whereby the product is not a goal in itself, but enabling the performance. In addition, the service is mainly a non-physical action or operation whereby the performance is optimized over time". According to Dabson and McAllister (2014), the diversity of the flexible office solutions varies with its multiple labes and has led to an element of inconsistency over what a serviced office comprises. Therefore, they have taken a broad definition: "A serviced office is defined as space within a building that is let, sub-let or licensed to third parties on a serviced basis. The services comprise all of the building services and a menu of business support services".

Conventional vs. flexible servitized office space

As discussed the concepts of servitization and Product-Service-Systems, an comparison can be made to see what the difference is between the introduction of Product-Service-System in corporate real estate as a flexible serviced office and a traditional office? Therefore, this section shows how an 'Office as a Service' concepts differs from a traditional office.

The business model of serviced offices is funded based on the same principles as other forms of outsourcing, namely the conversion of fixed costs to variable costs and the transfer of risk to another party (Dabson & McAllister, 2014). Instead of fixed costs associated with regular long-term leases and facility contracts, flexible serviced offices offer products with flexible contracts that can be classified as variable costs. This makes a shift as depicted in figure 3.8., in which the owner takes over more management tasks from the client/user.

Due to the change of shorter and flexible leases, the owner and/ or operator needs to shift focus from supplying square meters to supplying added value for the end user in the right user experience. If this will be done by offering Real Estate as a Service, the operator must ensure that his services continue to continuously meet the needs and demands of the user. If not, the end-user will choose someone else to meet his demands (Scholtens & Memelink, 2017).

Figure 3.8.: *Shift of facility service to owner (Scholtens & Memelink, 2017)*

3.4.4. WHAT: OFFICE AS A SERVICE

After looking into the 'why' of Real Estate (demand side) and the 'How' of the Decision Support System, this section explores the 'what' of 'Office as a Service' (supply side). This provides an alternative for the strategic decision approach. The supply side will be analysed in three parts in line with the three management levels as defined by Joroff et al. (1993): strategic, tactical and operational (appendix E.1.).

3.4.4.1. STRATEGIC

Office as a Service models

Chris Kelly (2018) differentiates a whole spectrum of forms which all are being called coworking but can be seen as the ecosystem of flexible workspace strategies. All of them serve a different strategic use or a different use case. He divides this spectrum of forms based on 'Off and on balance sheet' and 'Off and on premise'. Within this quadrant the three following flexible workplace strategies can be distinguished next to a traditional lease:

- Traditional coworking
- Colocated flexible workspace
- Hosted corpworking

	Off balance sheet	On balance sheet
Off premise	Traditional coworking Offsite conference	Hosted corpworking Managed workplace
On premise	Colocated flexible workspace Shared services Amenities	Traditional lease and corporate services

Table 3.2.: *Flexible workspace strategies (Kelly, 2018)*

The division based on 'off and on balance' is related to the new regulations. Under the new International Financial Reporting Standard (IFRS) 16 all leases (both finance as well as operating lease) with limited exceptions need to be reported on the balance sheet for lessees. i.e. lessees are required to reflect on the balance sheet their 'Right Of Use' (ROU) as an asset as well as the associated liability for the future payments. This is a significant change, since under the current guidance of IAS 17 only financial leases are reflected/capitalized on the balance sheet of the lessee. Consequently, the new standard will affect virtually all commonly used financial ratios and performance metrics of lessees such as EBIT(DA), operating profit and net income, in case of an operating lease agreement. However, IFRS 16 allows two exceptions:

- Leases with a lease term of 12 months or less with no purchase option;
- Leases where the underlying asset has low value when new.

Thus, for example, if a business rents a workplace for a few months, this does not have to be recognized on the balance sheet. Businesses currently tied into longer lease agreements may therefore consider seeking more flexible lease terms to help manage the impact on their balance sheet.

Next to Chris Kelly, Andrew Laing (2018) describes in his research 'Work and workplaces in the digital city' three emerging typologies of workplaces. These are:

- *Open house*: In which the organization opens up its workspace to collaborators, partners, and even public.
- *Cohabit*: In which groups of organizations share environments and actively encourage the intermingling of their workforces.
- *Coworking*: in which individuals and smaller organizations work together in communities.

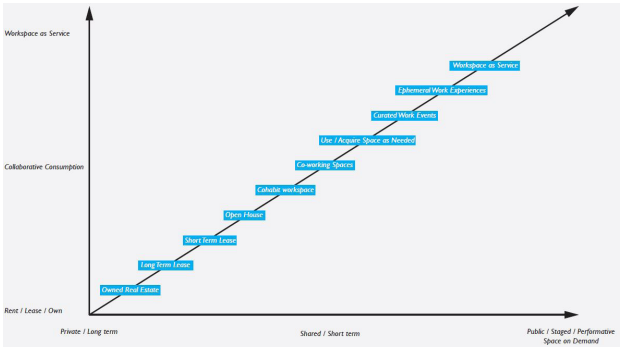


Figure 3.9.: *Emerging typologies of workspaces (Laing, 2018)*

Within figure 3.9., Kelly ranked these three emerging typologies of workspaces from privately owned or leased spaces to space being consumed collaboratively or provided as a service.

At last, JLL (2016) distinguishes four core models which can be applied by organisations seeking to exploit the benefits of coworking. The following four models (figure 3.10.) can be distinguished which increase in operational complexity

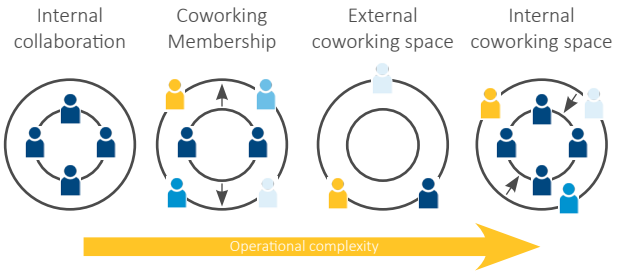


Figure 3.10.: *Coworking model (JLL, 2016)*

- *Internal collaboration*: An internal innovation hub is typically created exclusively for employees within a company's own office, providing flexible, creative space to suit a variety of work settings. Internal coworking spaces are set up by organizations seeking to improve collaboration and knowledge sharing, encourage innovative thinking, and inspire a cultural shift. This model also enables companies to signal to the new generation of employees that they are open to more flexible forms of working
- *Coworking membership*: Another option for companies seeking flexibility and ease of implementation is to purchase memberships in external coworking spaces. This allows companies to offer a variety of locations to their employees and accommodate any temporary increase in workforce. External memberships also provide a range of work settings and help companies to tap into new networks and keep a pulse on market developments without any costly modifications to their existing real estate and potential disruption to the wider company culture.
- *External coworking space*: Another option for organisations that wish to experiment with collaborative space is to work alongside a specialist provider to create a dedicated or ring-fenced external coworking area. This model results in minimal disruption to the existing space and allows companies to test coworking with specific areas of the business before introducing more widespread change. It provides all the benefits of internal and external innovation and is associated with a lower risk of disruption
- *Internal coworking space*: Companies create internal coworking space open to entrepreneurs and start-ups, often for free. Start-ups are usually selected via an application or interview process, but in return are provided with mentoring services. Building relationships in this way can help mature companies secure access to breakthrough technology or ideas at an early stage, while maintaining control over the space.

When comparing the models of Kelly, Laing, and JLL, the following combinations can be made which result in the final four models:

- Traditional lease
- Open house
- Colocated
- Coworking

Kelly (2018)	Traditional lease	Hosted corpworking	Colocated flexible workspace	Traditional coworking
Laing (2018)		Open house	Cohabit workspace	Coworking space
JLL (2016)	Internal collaboration	Internal coworking space		Coworking membership
				
	Traditional lease	**Open house**	**Colocated**	**Coworking**

Table 3.3.: *Strategic 'Office as a Service' models*

Pairing

Next to choosing one of the flexible workspace strategies, another strategic choice can be made to increase the flexibility: Pairing, a cooperation where corporates team up with the providers of flexible office/coworking space. Pairing blurs the dividing line between classic leases and coworking contract. A company no longer rents individual workplaces from a provider of this type of concept: instead, they form an alliance. These alliances can take three different forms (Coenders, 2019):

- The corporate subleases part of the office to the coworking provider.
- The coworking provider sings a long-term lease with the corporate.
- Both parties become main tenants together and make mutual agreements about the distribution.

Pairing creates a mix of single tenant construction complemented by a coworking zone suited to multi-tenant use.

But what is the added value of choosing for one of these forms of pairing? We can look into the benefits and risks. Starting with the benefits, it forges long-term links between the coworking market and that of corporates. It is an especially attractive proposition for companies keen to establish national coverage, yet lacking the critical mass of employees to justify more permanent office accommodation. It can also be beneficial to companies that are strongly project driven. It is a way out of the catch-22 situation in which a local presence can only be achieved at great cost with a half-empty office, while a local absence would have a negative impact on market share. Not having your own office forces employees to travel long distances, making them more likely to transfer their allegiance to a rival company with an office close by.

There are also risks to this approach. A cooperation between coworking providers and corporates does bring at least one dilemma. To what extent might the corporate's own identity be compromised by the recognizability of the coworking formula? It's a factor of considerable importance, especially in the age of the lifestyle office, where a successful office no longer stands out due to the difference in quality of the work area, but due to differences in image, style, and sense of community. First and foremost, the office has become a brand; and second, a place that people want to be part of.

The benefits and risks for both parties are summarized in table 3.4..

	Benefits	Risk
Corporate	Guaranteed room for the permanent core of employees Flexible shell employees has access to extra space if needed Accommodate the weekly peak occupation Corporate pays only an extra price for flexibility	How does the identity of the corporate relate to the recognizability of the operator
Operator	Guaranteed take-up of supply by the corporate Able to open a location in cities where setting up an independent coworking space might otherwise pose to much of a risk	

Table 3.4.: *Pairing added value*

When combining the various Office as a Service strategies with the pairing options, the following combinations can be made which are displayed in table 3.5..

	 Traditional lease	 Open house	 Colocated	 Coworking
No pairing	x	x	x	
Sublease		x	x	
Both main tenant			x	
Long-term lease				x

Table 3.5.: *Paring vs Office as a Service*

3.4.4.2. TACTICAL

Both Dabson & McAlliasster [§3.4.3], and Lizieri & Gibson (2000) describe that there isn't a single, clear definition of a flexible serviced office. They describe the flexible serviced office market as a very diverse market in terms of products offered, services and target groups. Within the market of flexible serviced offices different products can be distinguished. These products are all designed according to the 'Office as a Service' variables which are described under the operational level. Despite the fact that there are many variations of 'Office as a Service' products in the market, three main solutions can be distinguished:

- Serviced office
- Coworking space/incubator
- Managed space

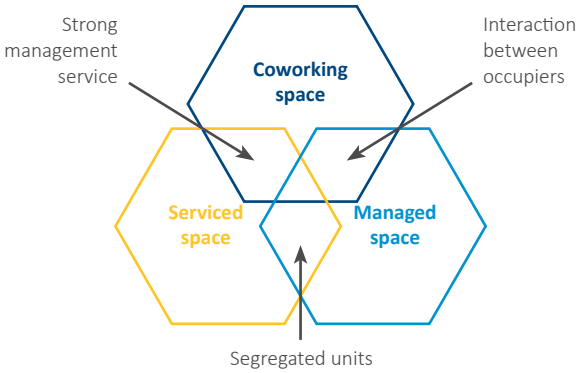


Figure 3.11.: *Office as a Service solutions*

3.4.4.3. OPERATIONAL

As mentioned in §3.2.3, 'Office as a Service' can be seen as a Product-Service-System. Therefore, on an operational level, 'Office as a Service' can be divided into supply variables that are related to the product side, the service side and some general variables. Appendix G.1. gives an overview of services and facilities that can be found within serviced offices. The overview of services and facilities derived from literature is quite comprehensive and includes most common services and facilities. Nevertheless, it is not fully exhaustive and other services and facilities can be added as serviced offices continue to develop.

Product

- Location
- Type of spaces
- Accessibility

Service

- Building services
- Food & beverage services
- Work related services
- Non-work related services

General

- Demographic/target group
- Contractual agreement
- Membership
- Industries

Figure 3.12.: *Office as a Service variables*

3.2.4. CONCLUSION OFFICE AS A SERVICE

This sub-chapter helps in providing answer to the sub-question: What theories and concepts apply to 'Office as a Service'?

'Office as a Service' is based on the underlaying theories of 'servitization' and 'Product-Service-Systems'. A serviced office is defined as space within a building that is let, sub-let or licensed to third parties on a serviced basis. The services comprise all of the building services and a menu of business support services. 'Office as a Service' can be analysed in line with the management levels of Joroff et al. (1993): strategic, tactical and operational. This includes four alternative strategies, three tactical solutions and three groups of variables out of which a Product-Service-System is built upon: product variables, services variables and general variables.

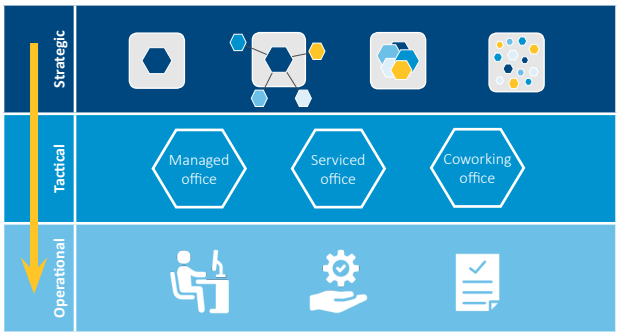


Figure 3.13.: *Conclusion Office as a Service*

CONCEPTUAL DESIGN

4

4. CONCEPTUAL DESIGN

This chapter presents the conceptual design of the 'strategic decision approach' and provides an answer to the following question: how to develop a strategic decision approach for 'Office as a Service'? This conceptual design is the integration of the literature study about the following bodies of knowledge: Real Estate Management, 'Office as a Service' and Decision Support Systems as described in chapter 3.

4.1. DESIGN DEVELOPMENT

As discussed in sub-chapter 2.1., the graduation research methodology is based on a hybrid research method which combines an operational and empirical research method. According to the research steps of an operational research to come to an conceptual design two steps are needed (figure 4.1.):

- *Establish specifications:* The specifications are based on the literature research of chapter 3 concerning the following bodies of knowledge: Real Estate Management, Decision Support Systems and 'Office as a Service'.
- *Generate alternatives: The established specifications are integrated and developed into a first conceptual design.*

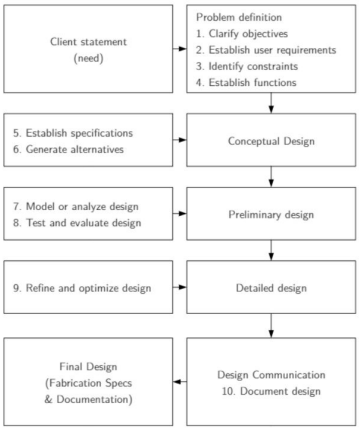


Figure 4.1.: *Steps of design process (Dym & Little, 2004, p.24)*

4.2. ESTABLISH SPECIFICATIONS

The specifications for the strategic decision approach that need to be considered in the development of the conceptual design arise from the literature study according to the three bodies of knowledge: Real Estate Management [§4.2.1], Decision Support Systems [§4.2.2.] and 'Office as a Service' [§4.2.3.].

4.2.1. SPECIFICATIONS 'WHY'

Concerning Real Estate Management, the development of the strategic decision approach needs to be based on the four stakeholder perspectives with their corresponding thirteen presumed added values through which real estate can add value to the organisation.

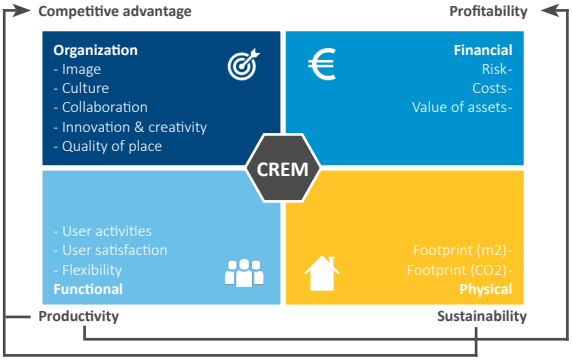


Figure 4.2.: Specifications 'why'

4.2.2. SPECIFICATIONS 'HOW'

Concerning Decision Support Systems, the development of the strategic decision approach needs to take into account the concept of Multi-Criteria Decision Analysis. As Decision-making in the field of (corporate) real estate management requires multiple objectives, which are often conflicting and come from different stakeholders. Based on these objectives, the different alternatives can be rated to make the most suitable decision.

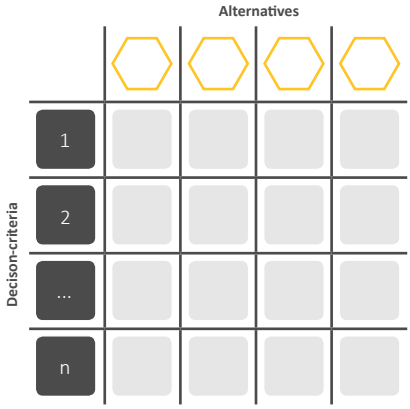


Figure 4.3.: Specifications 'how'

4.2.3. SPECIFICATIONS 'WHAT'

Concerning 'Office as a Service', the development of the strategic decision approach needs to take into account the strategic and tactical level of 'Office as a Service'. These form the input for the alternatives.

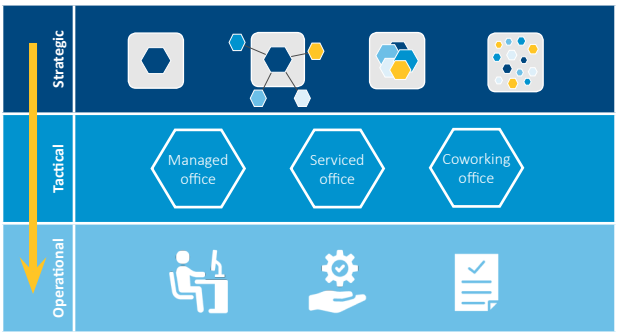


Figure 4.4.: Specifications 'what'

4.3. DEVELOPMENT CONCEPTUAL DESIGN

To generate the first design of a 'strategic decision approach' the concept of a Multi-Criteria Decision Analysis model is used. According to literature [§3.3.1.1.] the MCDA process is an iterative one and this process can be divided into three main phases:

- Phase 1: Problem identification and structuring;
- Phase 2: Model building and use;
- Phase 3:Development of plan of a plan of actions.

For the development of the conceptual design, his part of the research focusses on the first two phases.

Problem identification and structuring

As discussed in the problem analysis and problem definition [§1.3. & §1.4.], the constantly changing supply-demand relationship creates a mismatch between what the building can offer and what an organisation requires. As shown (figure 4.5.), this mismatch can be placed on the left side of the DAS framework, which is explained in appendix F.1. Therefore one of the biggest challenges in Corporate Real Estate Management is reducing the gap between the high speed of business and the slow speed of real estate, i.e. between the so-called dynamic real estate demand and relatively static real estate supply.

Based on the objective of Corporate Real Estate Management, the research objective of this graduation work is to develop and present knowledge of how the physical resource can be enhanced by implementing 'Office as a Service'. Because the mismatch is dynamic and will change frequently, a strategic decision approach to managing the mismatch between the user organisation and the building is proposed in order to offer a way of approach these problems. The purpose of this work is not to develop one strategy to enhance the physical resource, but to design a strategic decision approach to optimize the physical resource of organisations.

PROBLEM IDENTIFICATION AND STRUCTURING

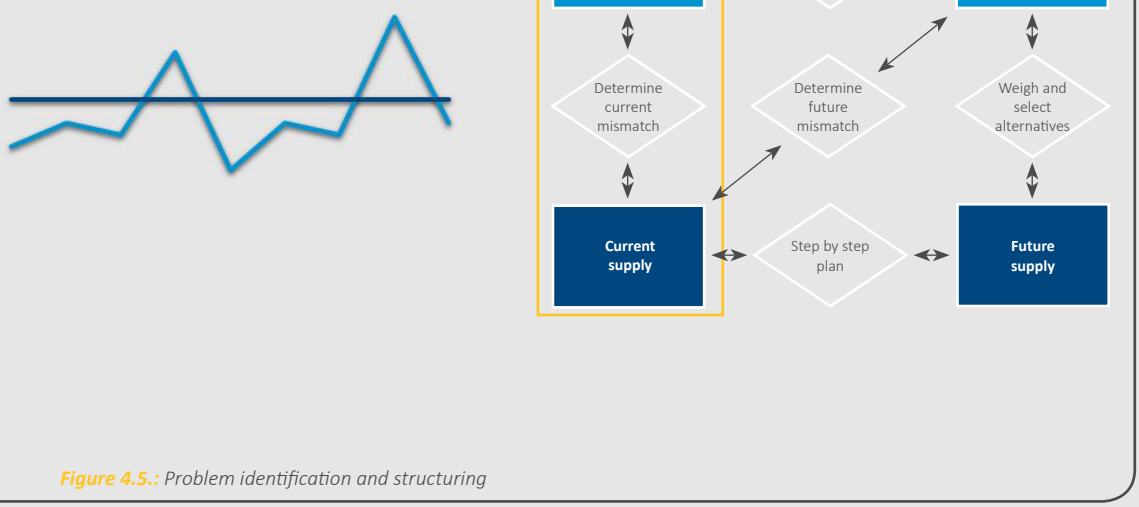


Figure 4.5.: Problem identification and structuring

Model building

According to literature [§3.3.1.1.), the formal procedure of MCDA consists of five steps (Binnekamp, 2010):

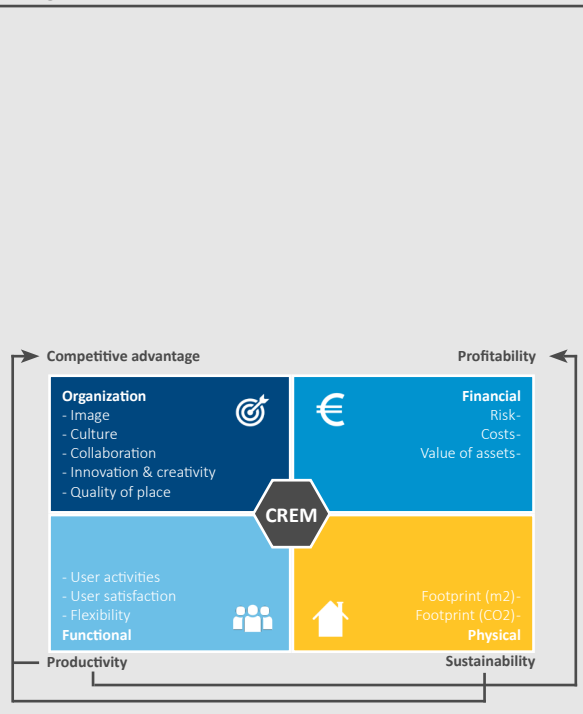
- Specification of alternatives
- Defining the decision-makers criteria tree
- Rating of the decision-maker preferences for each alternative in relation to each criterion
- Assigning the decision-maker weight to each criterion
- Using an algorithm to draw an overall preference scale.

For the development of the conceptual design, this graduation research takes into account the first four steps

- *Specification of alternatives:* The alternatives that are taken into account are based on the established specifications of 'Office as a Service' concerning the four 'Office as a Service' strategies as well as the three 'Office as a Service' solutions.
- *Defining the decision-makers criteria tree:* The decision-makers criteria that are taken into account are based on the established specifications of Real Estate Management concerning the four stakeholder perspectives with their related presumed added values.
- *Rating the decision-maker preference for each alternative in relation to each criterion:* Rating the alternatives on the decision-maker criteria will take place in the next step of the research [§5.2.1.).
- *Assigning the decision-maker weight to each criterion:* Related to the decision-makers criteria, each stakeholder perspective can give their preference. Next to that each stakeholder perspective can be given a decision-weight in the decision process.

Integrating all these points in a MCDA model, the conceptual design consists of a matrix (figure 4.6.) indicating the four stakeholder perspectives with the presumed added value of Real Estate on the vertical axis per type of 'Office as a Service' strategy and solution on the horizontal axis.

MODEL BUILT



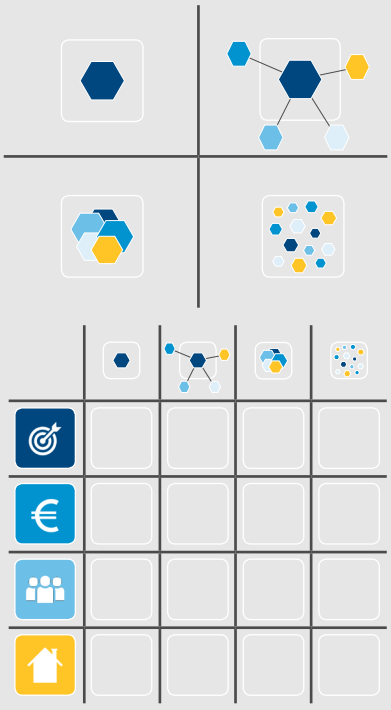


Figure 4.6.: Model built

Model use

The conceptual design of the strategic decision approach has the objective to align the supply with the demand of an organisation to obtain maximum added value by solving the current mismatch. Where the mismatch arises on the left side of the 'Designing an Accommodation Strategy' framework, solving the mismatch takes place on the right side of the DAS-framework. On this side the future demand (added value) is matched (weighted and selected) with the different alternatives ('Office as a Service' strategies) to determine the future supply. This alignment process consists of four steps (De Jonge, Arkesteijn, Den Heijer, Vande Putte, & De Vries, 2009):

- Determine future demand
- Design alternatives
- Weigh alternatives
- Determine future supply

Translating these steps into the use of the conceptual design of the 'strategic decision approach' the following steps need to be taken:

- *Determine future demand:* The future demand is determined by having the four stakeholder perspectives determine their preferences/objectives in combination with a given decision-weight per stakeholder perspective.
- *Design alternatives:* The alternatives are already designed and are based on the established specifications of 'Office as a Service' concerning the four 'Office as a Service' strategies as well as the three 'Office as a Service' solutions.
- *Weigh alternatives:* Rating the alternatives on the decision-maker criteria will take place in the next step of the research [§5.2.1.].
- *Determine future supply:* Based on the chosen objectives with corresponding decision-weight per stakeholder perspective, a total score can be calculated per alternative to determine the optimal solution.

The conceptual design of the 'strategic decision approach' is the result of the integration of the in sub-chapter 4.2. established specifications to 'why, how and what'. The first conceptual design of the 'strategic decision approach' is depicted in the next sub-chapter [§4.4.].

MODEL USE

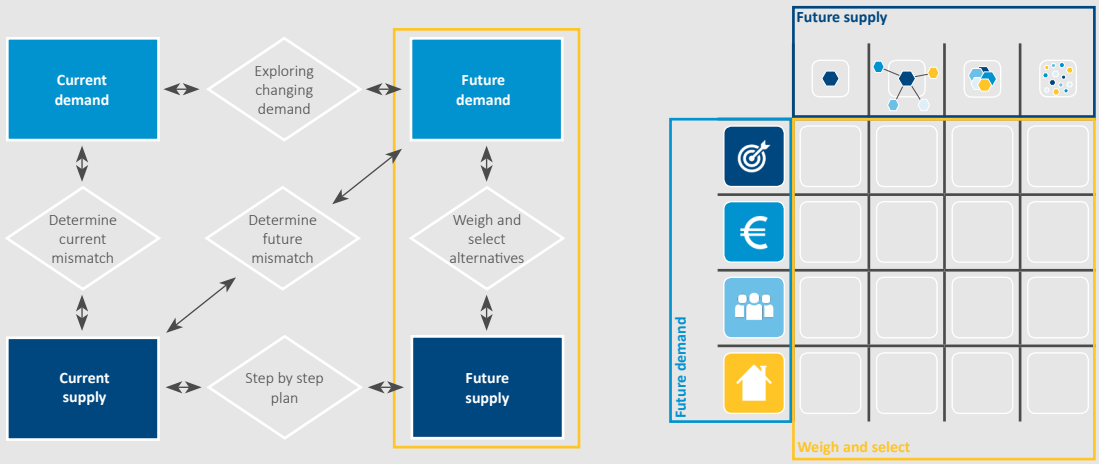


Figure 4.7.: Model use

4.4. CONCEPTUAL DESIGN

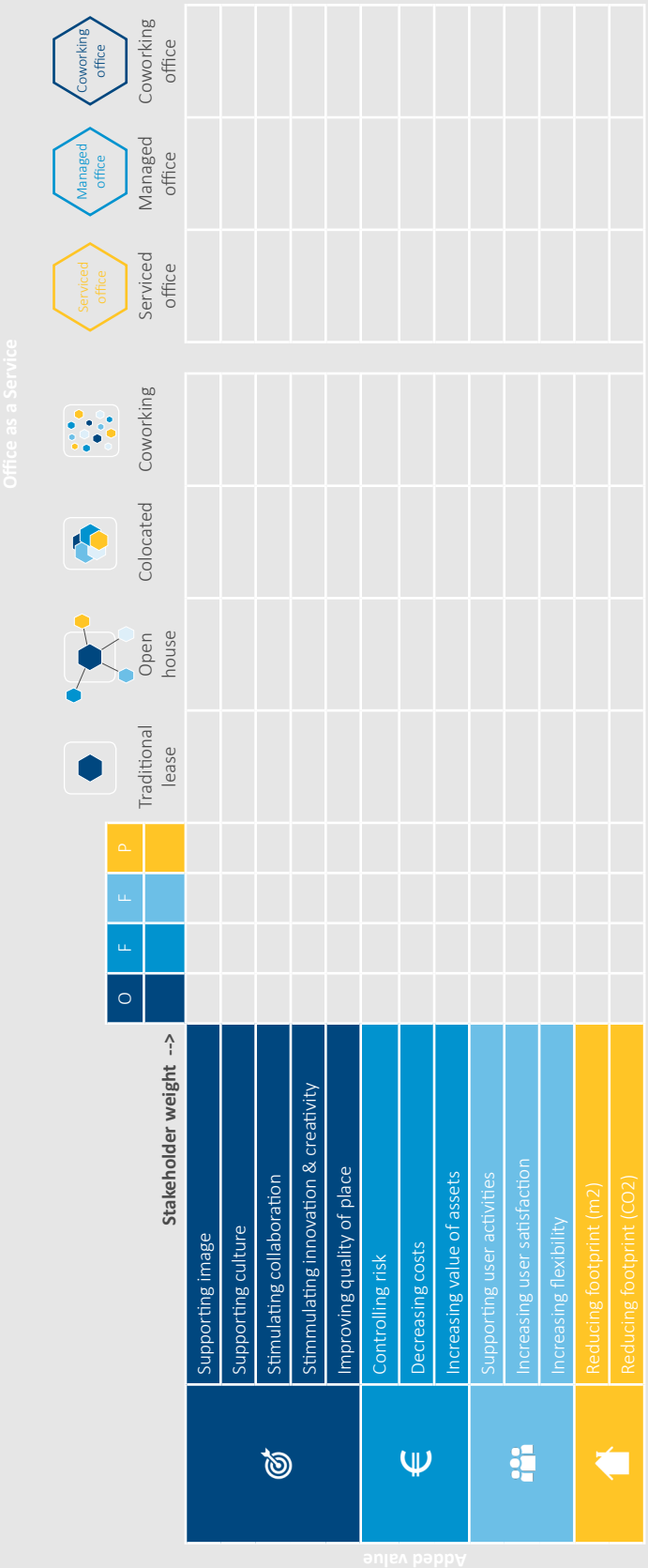


Figure 4.8.: Conceptual design


EXTREMELY
JUICY
CHARCOAL
BURGER
EXIT

PRELIMINARY DESIGN

5

5. PRELIMINARY DESIGN

This chapter presents the preliminary design of the 'strategic decision approach' and provides an answer to the following question: How can decision-making tools be evaluated? This preliminary design is the integration of a round of interviews with the conceptual design of the 'strategic decision approach'.

5.1. INTERVIEW

Limited practitioner experience and limited scientific literature about the 'Office as a Service', indicates a gap in our understanding. On open-ended semi-structured interview approach was chosen to obtain detailed and contextual understanding about the real-life dynamics in the corporate real estate industry regarding ''Office as a Service''. The goal of the interview process was to verify, supplement and refine the first conceptual design of the 'strategic decision approach', which was based on literature research. The results of the interview process supported the development of the preliminary design of the 'strategic decision approach'. This support is structured in the following three contributions and according sections:

- Verification, supplementation and refinement of the list of Key Performance Indicators related to the presumed added value of real estate on the performance of organisations.
- Verification, supplementation and refinement of the list of 'Office as a Service' strategies and 'Office as a Service' products.
- Verification, supplementation and refinement of the relationship between the presumed added value/ Key performance indicators (why) with the 'Office as a Service' strategies/products (what).

5.1.1. SELECTION OF INTERVIEWEES

Stakeholders that are related to the topic of ''Office as a Service'' can be placed in a triangle related to demand-supply. On the one hand the occupier who represents the demand side, on the other the market who represents the supply side, and at last the consultant who is the connection between demand and supply. For the research design both sides are taken into account. For the selection of interviewees both the consultants and the market parties are selected to verify, supplement and refine the conceptual design of the 'strategic decision approach', after which a case study round takes place with the occupier (demand side).

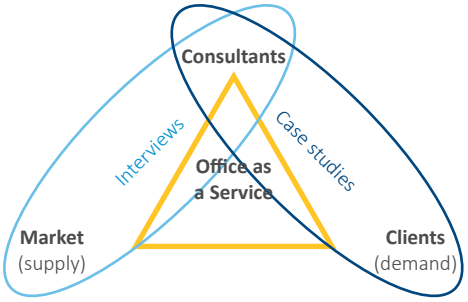


Figure 5.1.: Selection of interviewees

5.2. DATA ANALYSIS

5.2.1. 'Why'

In this sub-section all the input regarding the 'why' is taken into account. This looks into the verification, supplementation and refinement of the list of Key Performance Indicators related to the presumed added value of real estate on performance of organisations. Next to that, the 'why' is extended with 'occupier space demand types'.

Added values

The following table looks into the thirteen presumed added values of real estate, divided over the four stakeholder perspectives and their relationship with 'Office as a Service'. Each added value will be analysed according to the following two criteria:

- Present in relation to 'Office as a Service': Yes or No
- Which Key Performance Indicator(s) can be used to rate the different 'Office as a Service' strategies?

Out of the figure 5.2. can be concluded that eight added values, divided over all four stakeholder perspectives, are related to an 'Office as a Service' strategy. Together with the Key Performance Indicator this will be taken as input in the design of the preliminary design of the 'strategic decision approach'.

The five added values that are not taken into account are not included because of the reason that specifically related to the concept of 'Office as a Service' (improving quality of place, supporting user activities and increasing user satisfaction and reducing footprint (CO2) or is not included due the fact that this is viewed from the perspective of an end-user who has not the aim at resulting a higher potential (market) value of land and building.

WHAT

	Supporting image	Internal > external
	Supporting culture	Internal > external
	Stimulating collaboration	Variety of different user groups
	Stimulating innovation & creativity	Unplanned > planned encouters
	Improving quality of place	
	Controlling risk	Outcoursing
	Decreasing costs	cost per desk
	Increasing value of assets	
	Supporting user activities	
	Increasing user satisfaction	
	Increasing flexibility	> Contract duration
	Reducing footprint (m2)	square meters / desk
	Reducing footprint (CO2)	

Figure 5.2..: *Added value including Key Performance Indicator*

Occupier space demand

The problem analysis and problem definition [§1.2 & §1.3] show the constantly changing relationship between a building (supply) and its users (demand). This is visualised in a space utilization graph. Although the conceptual design of the strategic decision approach takes into account the added value which contributes to the strategic goals of an organisation, the operational space utilization to optimize the supply-demand relationship is not taken into account. Therefore, alongside the added values, the different typologies of occupier space demand are added to the 'why' in order to see how they are related to the different alternatives of 'Office as a Service'.

Applying the core/non-core concept to the corporate real estate portfolio, Gibson and Lizieri (1999) developed the Core-Periphery operational real estate portfolio space model as presented in appendix E.2. In terms of peripheral portfolio there appears to be four ways serviced offices are aligned (Dabson & McCallister, 2014). These are:

- "Migratory in" occurs where there is workforce growth or a consolidation in favour of a specific location but the workforce numbers are not large enough to justify the occupancy of the proposed building. Alternatively, the building construction or fit-out completion lags the staff build up.
- "Migratory out" occurs where a building is vacated and temporary accommodation is required for the workforce. This normally occurs where landlord wants repossession for reasons of redevelopment etc. or the tenant takes advantage of a lease end or break.
- "Flexible occupancy" occurs where the business needs accommodation that can respond rapidly to changes in headcount. This can be a function of the particular business unit or the business is piloting a new product, service, market or location.
- "Transitory project" occurs where the occupation depends upon a project or part of a project and the workforce change depends upon its success. The nature of the workforce change can be rapid, such as a step change.

Next to these four occupier space demand typologies, a fifth typology will be added. This occupier space demand typology looks into a 'constant headcount'. This will be done to make the comparison and show the effect between the core/non-core concepts. It should be noted that an occupier may also display characteristics of more than one type over time.

WHY - OCCUPIER SPACE DEMAND

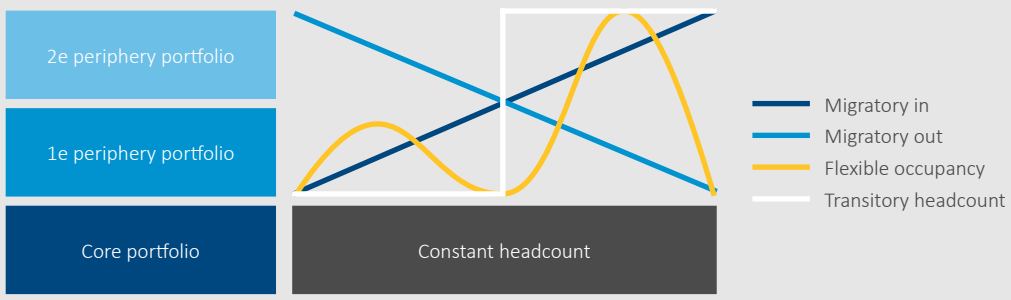


Figure 5.2.: *Occupier space demand typologies*

5.2.2. ‘WHAT’

In this sub-section all of the input regarding the ‘what’ is taken into account. This looks into the verification, supplementation and refinement of the list of ‘Office as a Service’ strategies and ‘Office as a Service’ products.

Tactical solutions

Within the conceptual design of the ‘strategic decision approach’ both the strategic and the tactical alternatives are taken into account. For the design of the preliminary design the decision is taken to only focus on the strategic alternatives and not to take into account the tactical alternatives. This is based on the following arguments:

- It stimulates more discussion when using the decision model.
- All three tactical alternatives can be chosen after choosing one of the four strategic alternatives.
- Different decision criteria are related to the tactical alternatives.
- Focus first on strategic choice, the tactical choice is best-suited to the next step.

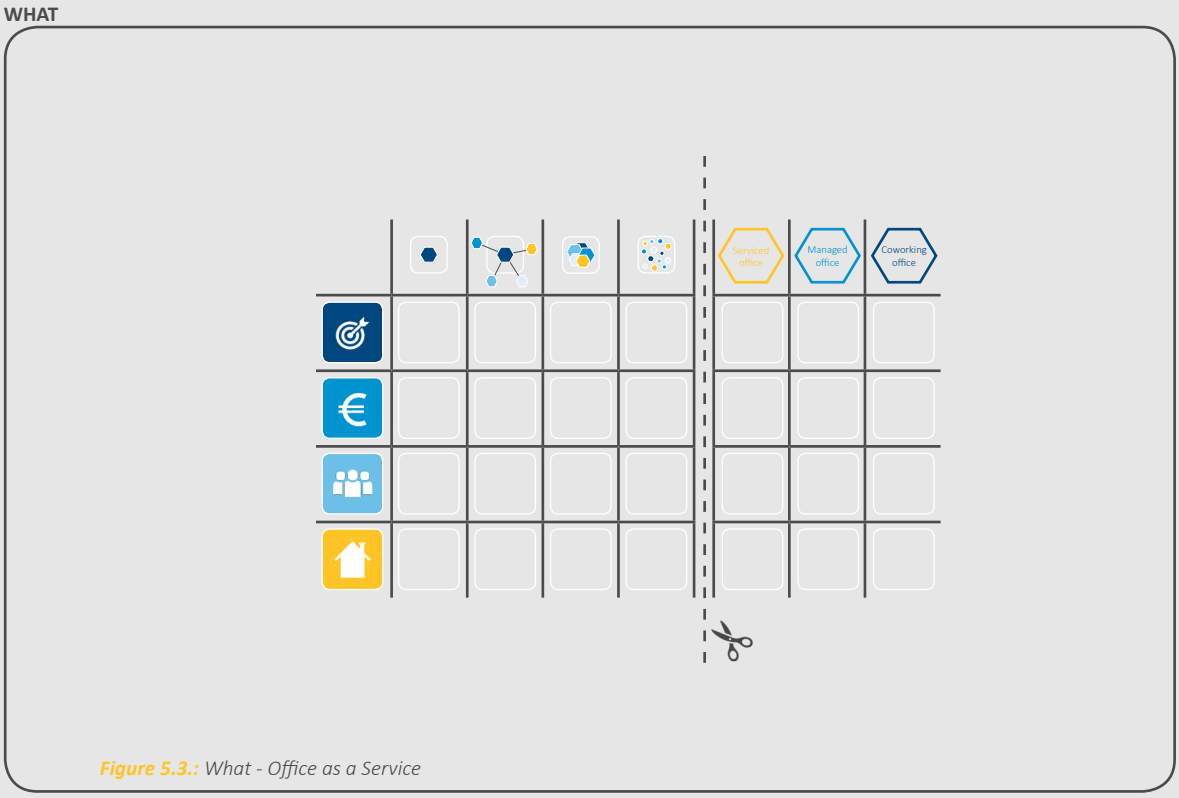


Figure 5.3.: What - Office as a Service

5.2.3. 'WHY-WHAT'

After verifying, supplementing and refining both the decision-makers criteria (added value & occupier space demand) [§5.2.1.] and the specification of alternatives ('Office as a Service' strategies) [§5.2.2.], the next step is to rate the alternatives in relation to each decision-criterion. This will take into account the eight added values and five occupier space demand typologies (figure 5.4.).

Added values

- *Supporting image:* Support the image of the current users or the external parties- or potential employees, customers or clients. This is best done with in an internal strategy instead of an external strategy, in which the 'open house' is preferred over a 'traditional lease' as more people grow familiar with your DNA/image.
- *Supporting culture:* Supporting culture is more related to the internal users, therefore this is best done with an internal strategy instead of an external strategy. Looking from the perspective of the end-user, an internal strategy supports your own culture, while an external strategy has the culture of the external office operator.
- *Stimulating collaboration:* Stimulating collaboration will be achieved by encounters between different users or user groups. Therefore, an external strategy is preferred over an internal strategy.
- *Stimulating innovation:* Stimulating innovation can be achieved by stimulating planned and unplanned encounters between users, in which unplanned encounters are preferred over planned encounters. Therefore an external strategy is preferred over an internal strategy.
- *Controlling risk:* This refers to controlling financial risks, or it may also refer to controlling technical and functional risks by carefully monitoring the technical condition to make sure primary processes are not hindered. Based on the principle of 'Office as a Service': outsourcing, an external strategy is preferred over an internal strategy as the risk can be placed with the external office operator.
- *Decreasing cost:* When decreasing cost, based on the cost per desk, an internal strategy is preferred over an external strategy. Though it is claimed differently, with an external strategy a premium is paid for the possible flexibility.
- *Increasing flexibility:* This is related to controlling risks that concerns the financial flexibility or flexible use of facilities by many types of users that enables an organisation to solve a problem in its real estate portfolio without hindering the primary processes. This is best achieved with in an external strategy instead of an internal strategy.
- *Reducing footprint (m2):* Reducing footprint (m2) looks into a reduction of m2 or an optimal use of m2. Therefore an external strategy is preferred over an internal strategy as only will be paid for what used.

Occupier space demand:

- *Migratory in:* As demand is growing over time, an 'open house' strategy is preferred over an external strategy as you are able to absorb your growth with external people.
- *Migratory out:* As demand is declining over time, an 'open house' strategy is preferred over an external strategy as you are able to absorb your shrinkage with external people.
- *Flexible occupancy:* As demand is flexible an external strategy is preferred over an internal strategy. This is due to the rapidly changing response in supply regarding what can be used and when it is needed.
- *Transitory headcount:* As demand depends upon a project, an external strategy is preferred over an internal strategy. This is due to the rapidly changing response in supply what can be used and when it is needed.
- *Constant headcount:* As demand is constant the strategy 'traditional lease' is preferred as this can supply the right amount of space without paying an extra fee for the unneeded flexibility.

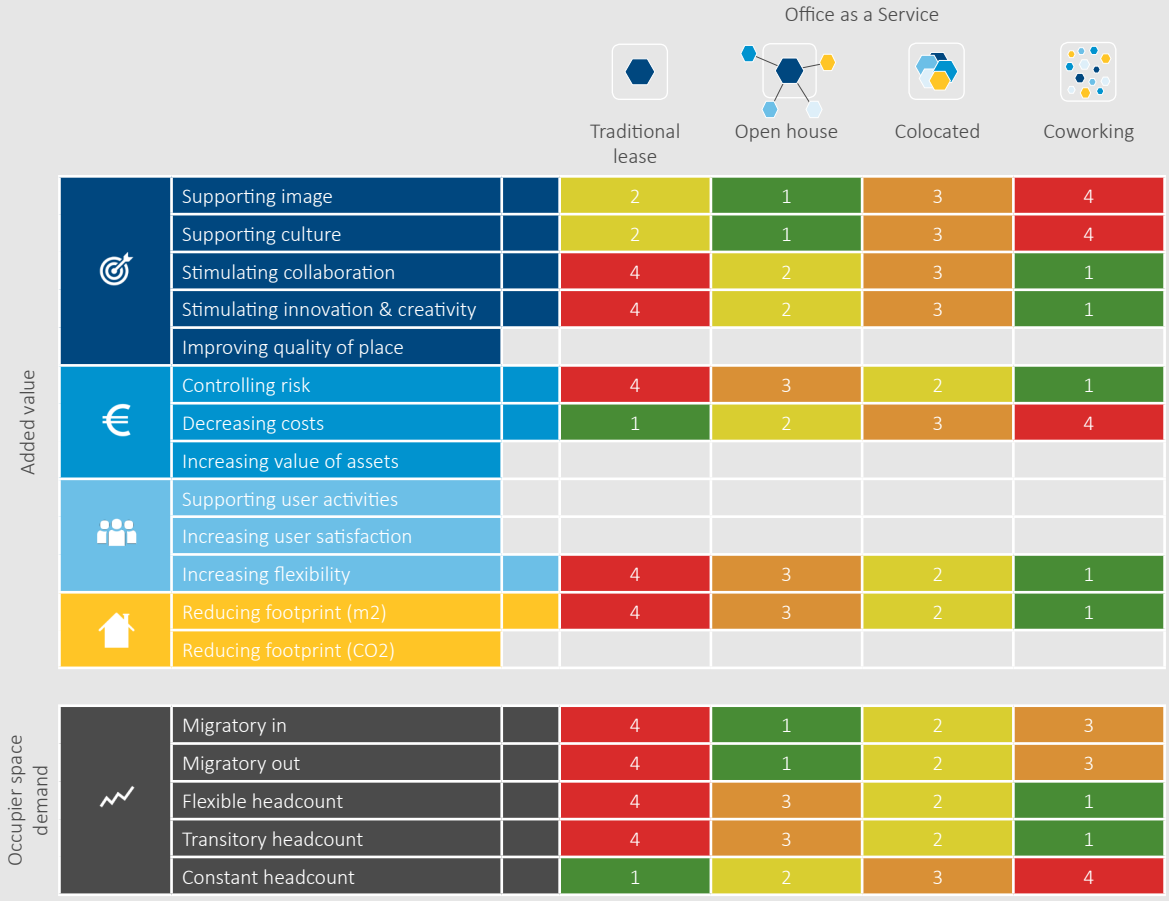


Figure 5.4.: *Why-what - Office as a Service*

5.3. DEVELOPMENT PRELIMINARY DESIGN

The preliminary design of the 'strategic approach' is the result of the integration of the data out of the interviews related to 'why, how and what' with the conceptual design of the 'strategic approach' out of sub-chapter [§4.4].

- *Why:* Out of first thirteen presumed added values that are taken into account as an input for the conceptual design, eight added values can be related to the concept of Office as a Service. These eight added values, with their corresponding Key Performance Indicator, are included in the development of the preliminary design. The remaining five added values are, although not related to Office as a Service, not yet removed out of the design of the 'strategic approach'. This will be done due to the reason that these added values may still be mentioned in the next research step and therefore can still be taken into account in the development of the 'strategic approach'. Next to the added values, which contribute to the strategic goals of an organisation, the 'why' is extended with an operational aspect which looks into five 'occupiers space demand typologies'.
- *What:* Out of the alternatives that are taken into account as an input for the conceptual design, the three tactical solution of 'managed office', 'serviced office' and 'coworking office' are taken out of the design. As these alternatives are related to different decision criteria which would provide more descussion when using the decison model. In addition to that, eacht tatcial alternative can be chosen after choosing a strategic alternative. So this does not exclude any options.
- *Why-what:* Based on the eight related added values with their corresponding KPI's and the five occupier space demand typologies, the four Office as a Service strategies are rated against each other from 1 to 4. In which 1 is the preferred option in relation to the decision-criteria.

The preliminary design of the 'strategic approach' is depicted in the next sub-chapter [§5.4.].

PRELIMINARY DESIGN

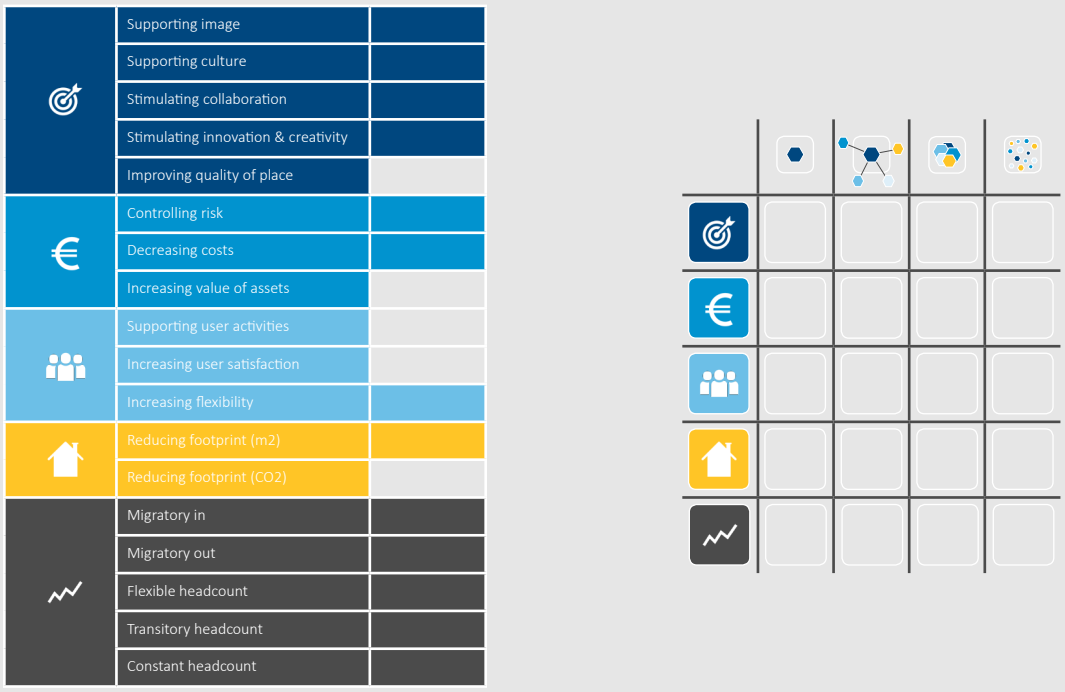


Figure 5.5.: *Development Preliminary design*

5.4. PRELIMINARY DESIGN

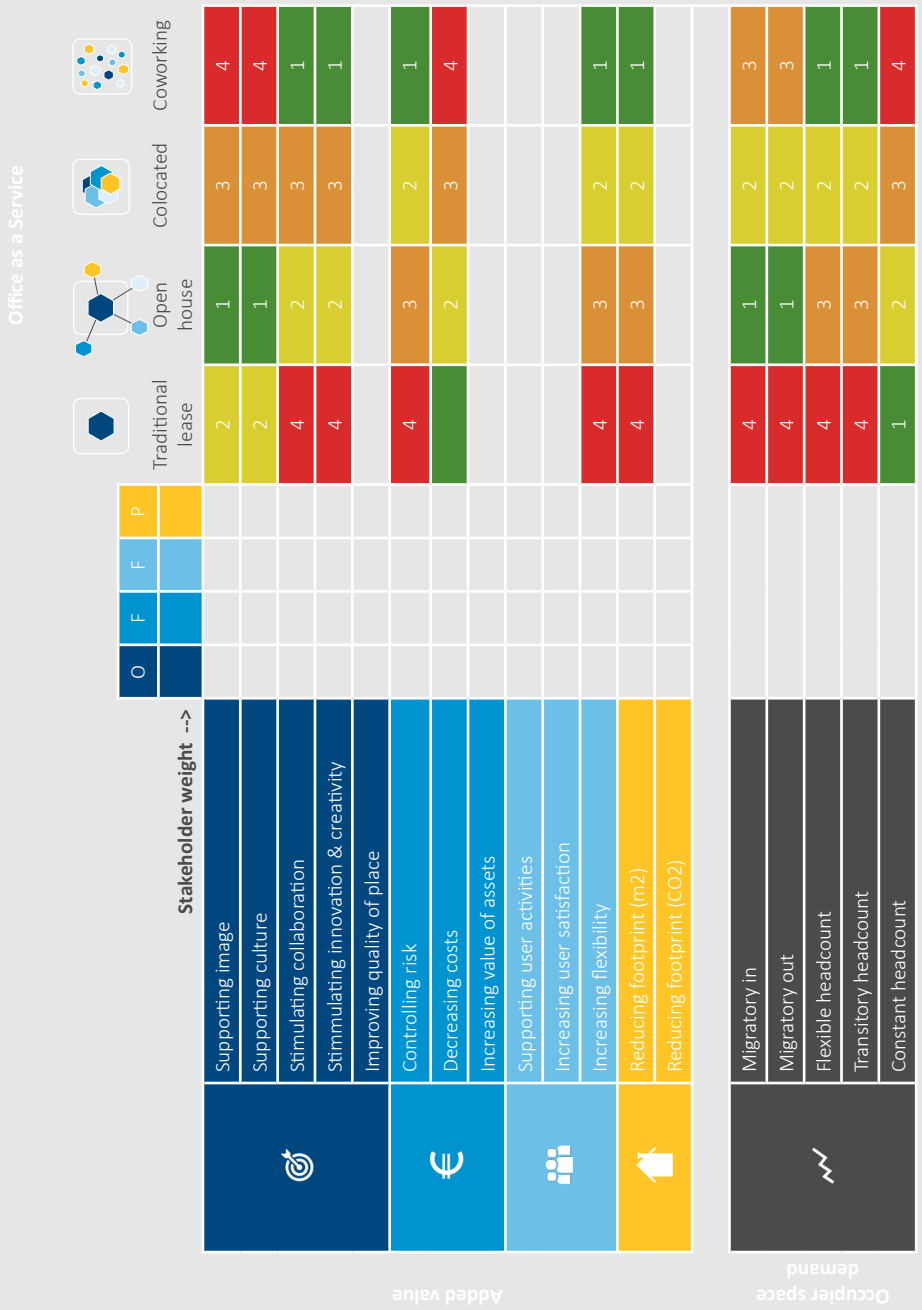


Figure 5.6.: Preliminary design


JOURNEY
You will
NEVER
INFLUENCE THE WORLD
BY TRYING TO BE
LIKE IT
BE
SMART

DETAILED DESIGN

6

6. DETAILED DESIGN

This chapter presents the detailed design of the 'strategic decision approach' and works to provide an answer to the following question: How is the strategic decision approach related to practice? This detailed design is the result of the integration of the data gathered from the literature study (chapter 3), the interviews (chapter 5) and the comparative case study which is presented in this chapter.

6.1. CASE STUDIE

Case studies are used in this research to create empirical knowledge. A comparative case study approach was chosen to link this research to practice as this research is designed to solve real-life problems. The results of the case study process supported the development of the detailed design of the 'strategic decision approach'. This support is described by the following contributions and sections:

- Verification, supplementation and refinement of the list of Key Performance Indicators related to the presumed added value of real estate on performance of organisations
- Verification, supplementation and refinement of the list of 'Office as a Service' strategies.
- Verification, supplementation and refinement of the relationship between the presumed added value/ Key performance indicators (why) with the 'Office as a Service' strategies/products (what).

6.1.1. READERS GUIDE

In order to create empirical data from these case studies, a cross-sectional case study design has been applied after the case studies were described (Bryman, 2012; Yin, 2014). The techniques used for the design of this cross-sectional case study design are the in-case analysis and the cross-case analysis (Eisenhardt, 1989).

The three selected case studies are discussed separately in this chapter. Each case study description starts with an overall introduction of the project, which provides background information about the project context and the implementation of an 'Office as a Service' strategy. This is followed by the presentation of the in-case analysis of each case study. The information obtained from the in-case analysis will be presented in three steps:

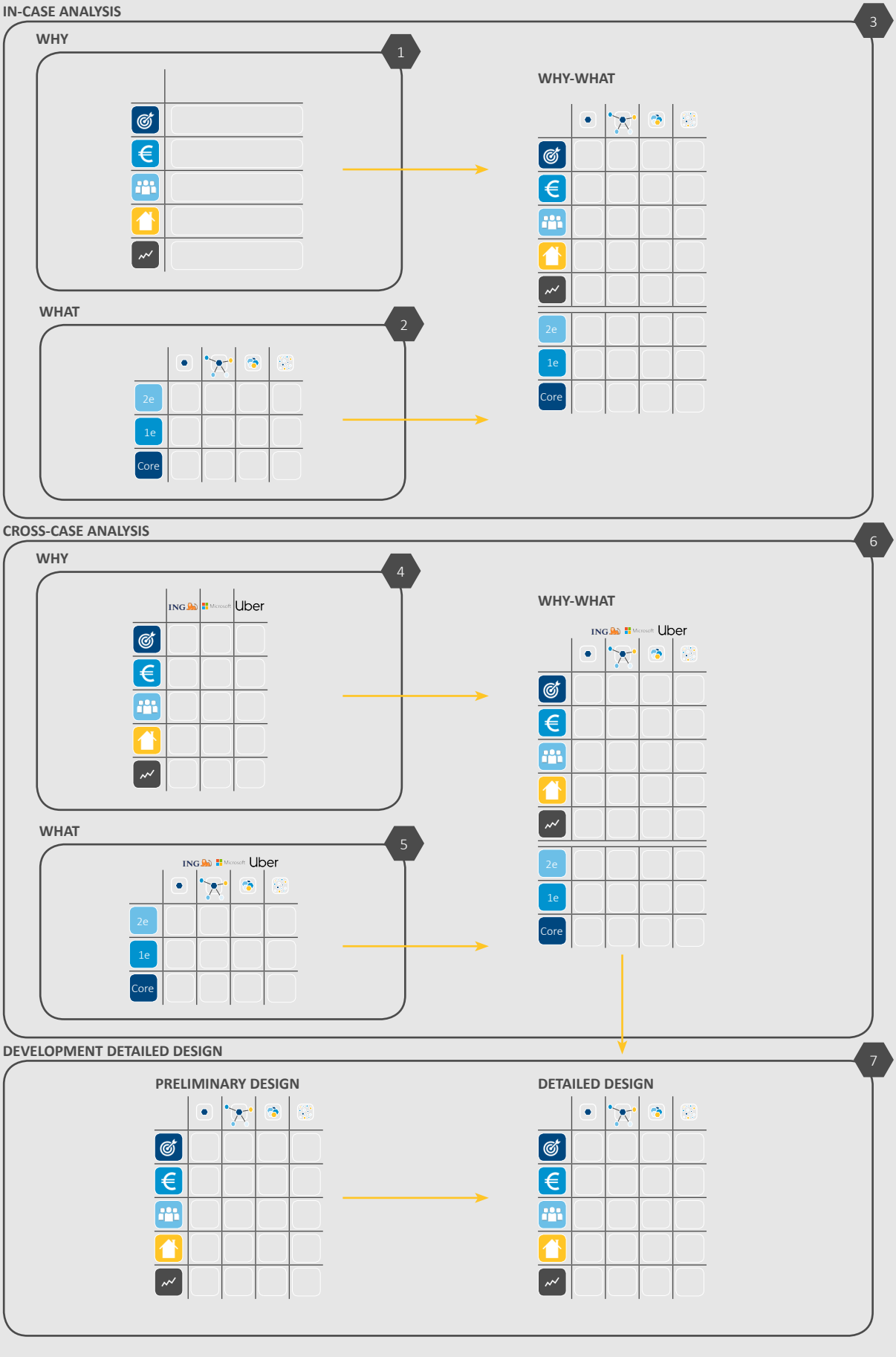
- Step 1: *why* – what are the intended objectives/added values;
- Step 2: *what* – what are the chosen strategies;
- Step 3: *why-what* – how are they related to each other;

A cross-case analysis was made after the in-case analysis. The cross-case analysis aims to identify similarities and differences between the case studies. To do this, a pattern matching technique is used (Eisenhardt, 1989; Yin, 2014). In this cross-case analysis the same three steps are used as within the individual analyses.

- Step 4: *why* – compare the intended objectives/added values;
- Step 5: *what* – compare the chosen strategies;
- Step 6: *why-what* – compare the relations;

The outcomes out of the cross-case analysis are then compared with the preliminary design of the strategic decision approach in order to come to a detailed design:

- Step 7: integrate data of the cross-case analysis with the preliminary design of the strategic approach;


IN-CASE ANALYSIS
3
WHY
1
WHY-WHAT
WHAT
2
2e
1e
Core
CROSS-CASE ANALYSIS
6
WHY
4
ING
Microsoft
Uber
WHY-WHAT
WHAT
5
DEVELOPMENT DETAILED DESIGN
7
PRELIMINARY DESIGN
DETAILED DESIGN

Office
Cumulus Park

Adress
Bijlmerdreef
Amsterdam Zuidoost

"Empowering people to stay a step ahead in life and in business"

6.2. ING

The ING Group is a Dutch multinational banking and financial services corporation headquartered in Amsterdam. It provides a full range of banking services. ING moved their international headquarters to the Bijlmerdreef in the southeast of Amsterdam in 2019. The move is part of ING's 'Think Forward' strategy, which was implemented in 2014 and emphasizes innovation, flexibility and being part of the community.

ING is building a campus. More than just the site for the bank's new global headquarters, the campus will be a place where multiple partners can collaborate on new ideas and incubate them into truly empowering new services – in line with ING's purpose to empower people to stay ahead in life and in business.

ING is working with the city of Amsterdam to establish the campus as an innovation hub for start-ups, scale-ups and entrepreneurs. As well as for universities, researchers, corporate partners and professionals such as patent lawyers, investors and consultants.

The idea is to create a space in the southeast of the city that attracts the brightest minds and connects people from all walks of life who are passionate about changing old ways and moving the world forward. It will be a community where they can work, live and socialize, with restaurants, sports facilities, laboraties and green spaces.

ING plans to move the first employees and partners to the campus in the second half of 2019. It will continue to be developed until 2024.

6.2.1. IN-CASE ANALYSIS

6.2.1.1 WHY

ING is seeking a connection with the city and its residents. ING has its own office concept, but above all it wants to emphasize the dynamic of the company through the design of its new office: from stately bank to a dynamic company that is close to the customer.

Added value

This objective to make a connection with the city and its residents can be translated to the following added values:

- *Supporting image:* the new office needs to support the image of a dynamic company that is close to its customer base. In addition, it needs to attract the brightest minds and connect people from all walks of life who are passionate about changing old ways and moving the world forward.
- *Stimulating collaboration / stimulating collaboration:* In line with ING's purpose to empower people to stay a step ahead in life and business, the new office needs to facilitate a place where multiple partners can collaborate on new ideas and incubate them into truly empowering new services. "The benefit of having players from multiple industries and backgrounds in one place is that it will lead to solutions and services that can't be created by one single party."

Occupier space demand

On operational level this can be translated into the following typologies of occupier space demands:

- *Constant headcount:* For their new headquarters a 'constant headcount' demand of 2600 needed to be taken into account.
- *Transitory headcount:* Occasionally, there is the need to accommodate a project team for stand-alone projects in a specific start-up phase or if a new office is opened in a new city or country.

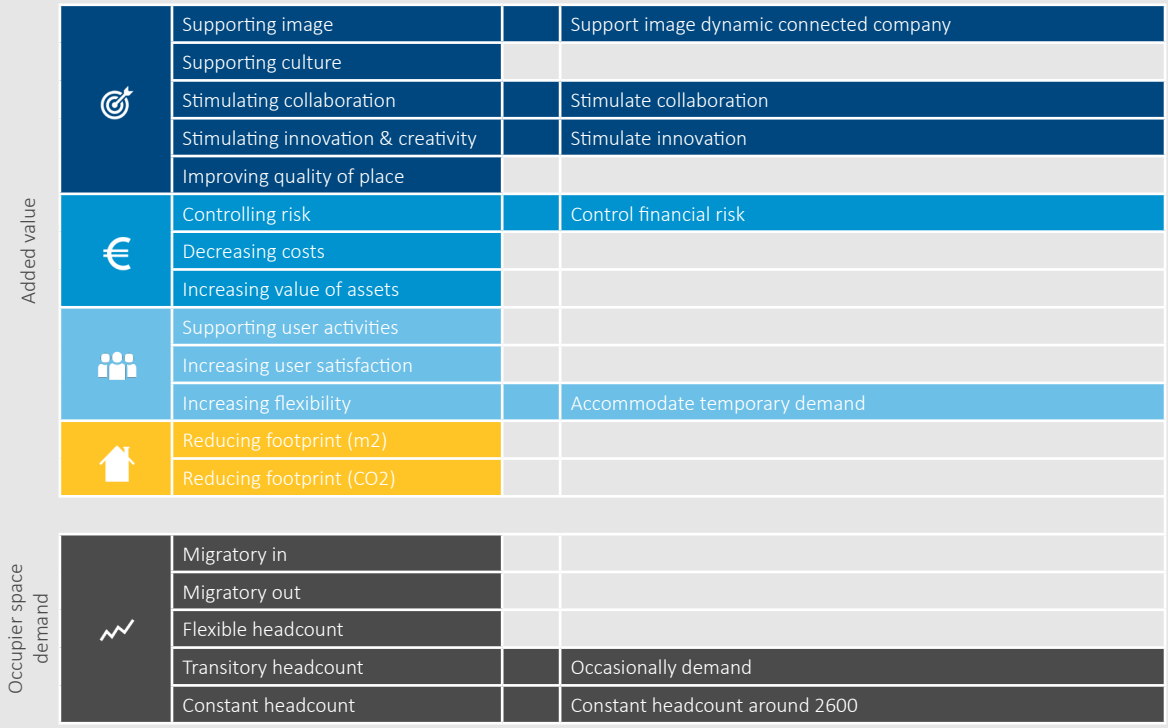


Figure 6.1.: *ING in-case analysis 'why'*

6.2.1.2. WHAT

The newly developed global headquarter of ING is a five story high building with a total of 40.000 square meters of office space located in Amsterdam next to their former headquarter 'Het zandkasteel' and train station Amsterdam Bijlmer Arena.

- *Traditional:* Out of the five story high building with a total of 40.000 square meters, the upper four floors with a total of 32.000 square meters are proving space for ING employees only. These four floors are separated and secured on the first floor by a turnstile.
- *Open house:* More than just the site for the bank's new global headquarters, ING is building a campus. The residual 8.000 square meters on the ground floor are open to the public. This ground floor offers various facilities as a coffers and offers accommodation to the innovation hub.

  Together with the city of Amsterdam, ING is working to establish the campus as an innovation hub for start-ups, scale-ups and entrepreneurs. As well as for universities, researchers, corporate partners and professionals such as patent lawyers, investors and consultants. The campus will tap into three knowledge areas: data science, behavioural science and engineering and technology, which includes artificial intelligence, blockchain and user experience.

  Although located in the newly developed headquarters of ING, the campus will have their own dedicated space and entrance in a separate part of the building. This is due to security reasons: ING doesn't want external people to have access to the office floors of ING employees.

  Developing a campus is one task, operating a campus is something different. Because ING doesn't have this expertise themselves, they work together with 'Plug & Play' an incubator company who is specialised in building communities, hosting events, but who is also searching and screening for the most suitable start-ups and scale-ups. The possibility to choose for an office operator like WeWork was deliberately not chosen. This has to do with the identity and control of the campus. If WeWork would become the operator, it wouldn't be an "ING campus" anymore due to a loss of identity.

  Next to the campus, a variety of facilities will be realised which are open for all users and the public. These include a 900 square meter pavilion in the middle of the campus with a restaurant for breakfast, lunch and dinner together with some multi-functional spaces and in the main office building there is a coffee bar on the ground floor.
- *Coworking:* Although ING in generally makes use of a 'traditional' strategy, the 'coworking' strategy is used at occasional moments to supply a temporary demand for office space. When choosing for one office operator, there is not a clear policy that is used to make such a decision. "Although a variety of different office providers with their own identity, they are all just a bit the same and all just a bit different. Therefore, the choice often comes down to speed, price and location. And if there are two more or less the same, then it is up to the personal preference." However, often office providers like Spaces and WeWork are used, as they have the advantage of a wide range of offices at different locations. In addition, ING has a direct connection with dedicated account managers within these office operators. This makes it easier to arrange a temporary office space with them.

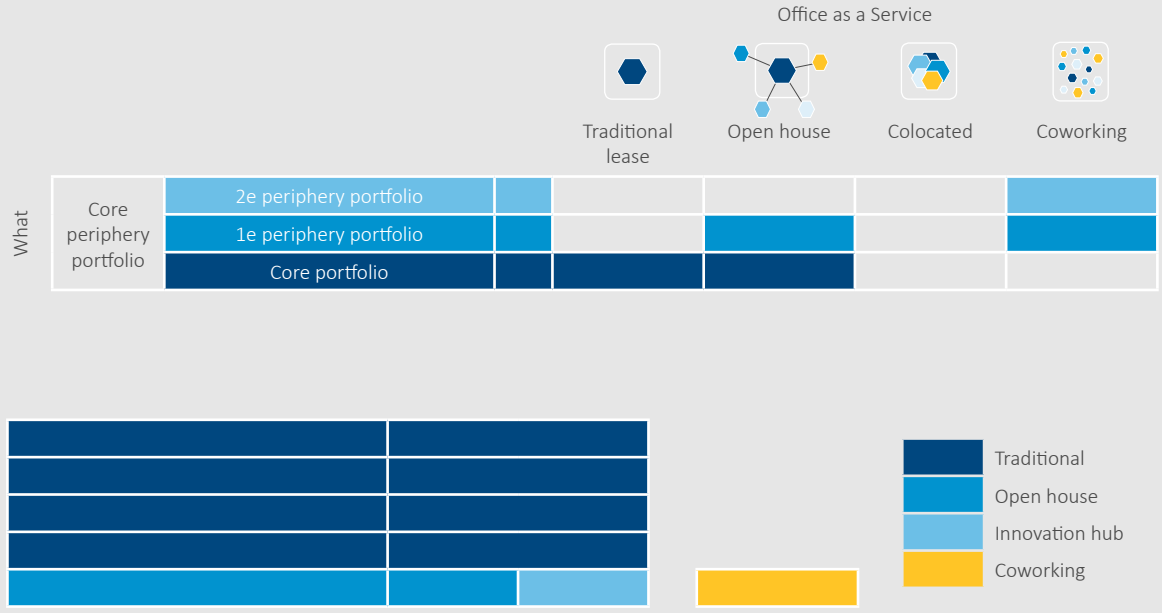


Figure 6.2.: ING in-case analysis 'what'

6.2.1.3. WHY-WHAT

Now that both the 'why' and 'what' are defined, the relationship between both of them can be made to understand how the different strategies are serving the demand objectives.

Added value

In relation to the added values the following 'Office as a Service' solutions are chosen:

- *Supporting image:* The demand for 'supporting image' can be assigned to both 'traditional' and 'open house'. With the development of a new head office with an accessible ground floor, a public pavilion in the heart of the site and an innovation hub to stimulate collaboration and innovation, ING wants to emphasize the dynamic of the company with the new office: from stately bank to a dynamic company that is closer to the customer.
- *Stimulating collaboration / stimulating innovation:* Stimulating collaboration and stimulating innovation can be specifically assigned to the 'open house' strategy. With the realisation of a campus, an environment is created that stimulates encounters between people from different backgrounds. Together with an operator who is taking care of creating a community, hosting events and selecting parties, ING tries to stimulate innovation through planned encounters.

Occupier space demand

In relation to the occupier space demand the following 'Office as a Service' solutions are chosen:

- *Constant headcount:* The demand for a 'constant headcount' can be assigned to the 'traditional' strategy. In general, ING is an organization who mainly uses the 'traditional' strategy to accommodate their demand. To achieve a certain degree of flexibility within the traditional leases, ING makes combinations of different office buildings with different lease lengths and/or with different rental expiring periods
- *Transitory headcount:* The demand for a 'transitory headcount' can be assigned to the 'coworking' strategy. According to ING, these stand-alone project teams have the character of a start-up with a different dynamic compared to a 'standard' project, which fits with the characteristics of a 'coworking' strategy. Or when a new office is opened in a new city or country, when its to risky to set up an office and enter into a long-term lease and make investments in the fit out as you do not know where you will be in 5 or 10 years' time.

Conclusion

Out of the in-case analysis of ING in relation to the 'why', 'what' and 'why-what' the following conclusions can be drawn: The choice for an 'open house' strategy within their newly developed headquarters is based entirely on the objective to support the image of a dynamic company that is close to its customer base and to support the demand for innovation by working together with others. The space dedicated for the 'open house' strategy is therefore not derived from the objective to increase flexibility. Although it would be a fantastic addition.

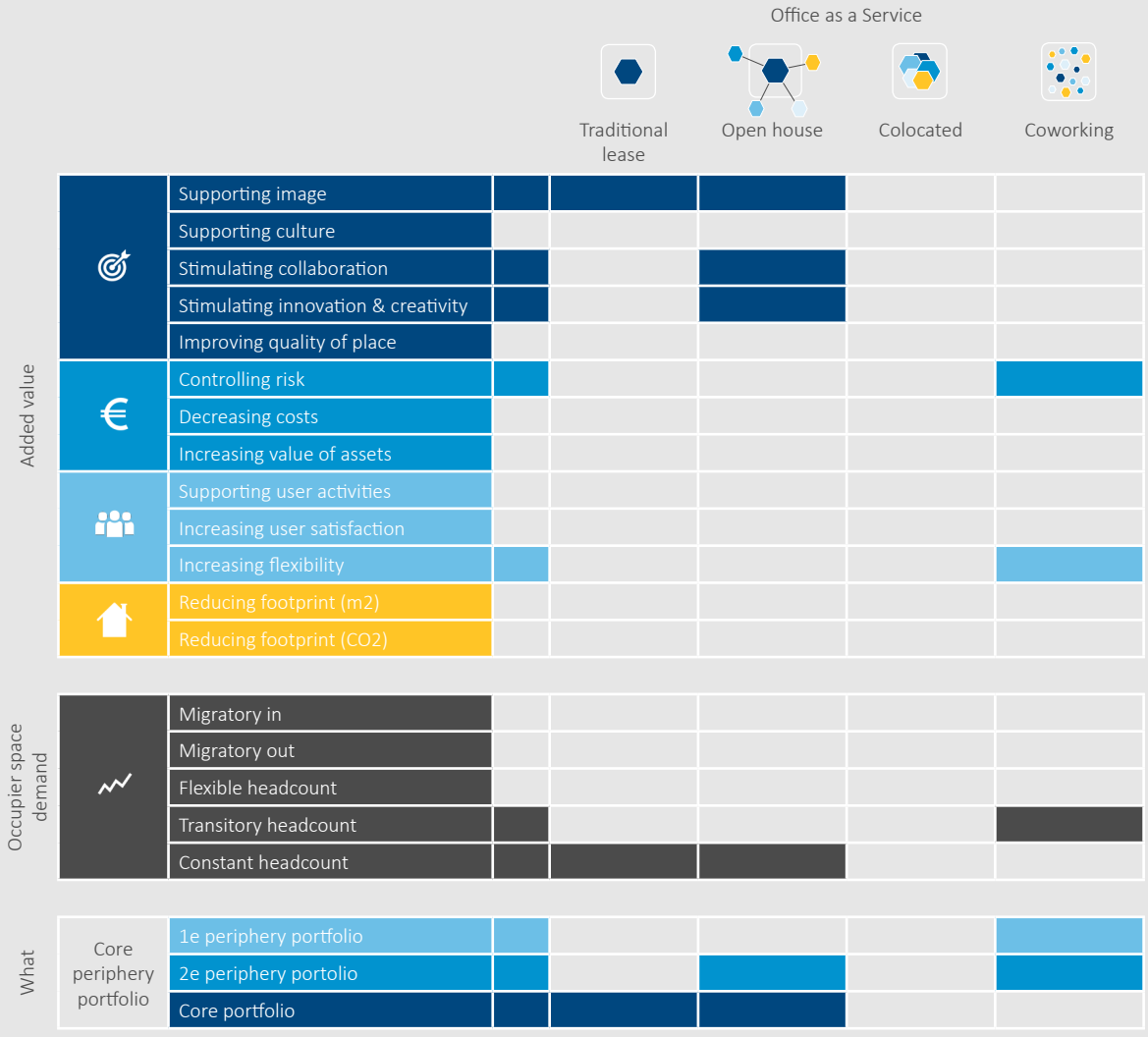


Figure 6.3.: *ING in-case analysis 'why-what'*


on the planet
to achieve
more.
STEPPING STONE
STAIRS
PUBLIC ARENA
FIRST FLOOR

Office
The Outlook

Adress
Evert van de Beekstraat 354
Schiphol

Microsoft

"Empower every person and every organization on the planet to achieve more"

6.3. MICROSOFT

Microsoft is an American multinational technology company. It develops, manufactures, licenses, supports and sells computer software, consumer electronics, personal computers, and related services.

Microsoft wants to give everyone the opportunity to get more out of a day, to make a difference in what is really important, and to develop a mindset of growth. The renovation of their office was the opportunity for the symbolic renewal of the entire organization. During this refresh period, for which the premises were actually closed, they became more creative in their daily work processes (asking the question: where do you work, when and how?)

This mission means that they put their customer first in everything they do. That is why, among other things, they have increased the amount of accessible office space for customers from 31% to 72%. The entire new Microsoft office has become a Customer Experience.

Ten years ago, Microsoft Netherlands embraced new ways of working in which fixed workplaces and fixed hours disappeared. The internet made it possible for employees to collaborate remotely, but after 10 years it was time to review that approach. Two factors played a role in this: the lease contract for the current building expired, and employees indicated in surveys that their work-life balance was disrupted.

6.3.1. IN-CASE ANALYSIS

6.3.1.1 WHY

As mentioned in the introduction, 10 years ago, Microsoft Netherlands embraced the new ways of working. But after 10 years it was time to review that approach. The new working environment needed to reflect their changing view on The New Ways of Working. 10 years ago it was mainly about time and place independent work, initiated from work-life balance and productivity, today it is mainly about organization independent collaboration in multidisciplinary teams.

"If you really want to help the customer further, you must jointly investigate what the technological trends mean for his business and how he can respond to that. This means that you have to open up your office much more to customers, partners and other parties."

Added value

Their new view on The New Ways of Working can be translated into a set of added values that needed to be answered by the new working environment. The following added values are stated:

- *Supporting culture:* the new working environment needed to support their image. Not only to visitors and clients, but also to potential future employees whose value has increased due to current scarcities within the IT labour market.
- *Stimulating culture:* Microsoft realized that they could only completely transform if they put their customers, partners and employees at the centre of everything they do. For this reason they have undergone a cultural change. A new mindset where customer focus, diversity inclusion and work as one Microsoft are central. To achieve these new forms of behaviour, they came up with the following rituals:
  - Team up
  - Contribute in engagement with others
  - Be open for everyone
  - Respect focus time
  - Always make conscious choices
  - Allow ourselves time to refresh

  These six rituals are needed to help to drive behavioural transformation focused on two main elements: Intentional collaboration and attention.
- *Stimulating collaboration: o*riginated from 'supporting culture', the accommodation needed to support collaboration. "If you really want to help the customer further, you must jointly investigate what the technological trends mean for his business and how he can respond to that. This means that you have to open up your office much more to customers, partners and other parties."
- *Stimulating innovation:* As a technology company, Microsoft offers companies and individuals technological solutions to improve their business. With the accelerating change of technology, it is important to keep up with this change and to come up with new innovative ideas.
- *Supporting user activities:* next to facilitating collaboration, the working environment also needed to make it possible to optimize attention. Van der Vlugt: "How can you optimize attention – both business and private – so that employees can focus on the really important things? That was also an important starting point for the realization of the new office.
- *Increasing user satisfaction:* As mentioned in the introduction, next to the expiration of their lease contract, employees indicated in surveys that the work-life balance was disrupted. "The latter was really an issue. In our satisfaction survey, we scored the lowest in ten years," says Van Haaster.

Occupier space demand

On an operational level almost a thousand people work for Microsoft in the Netherlands, but they are not always at the Schiphol headquarters. Therefore, the occupier space demand can be translated into the following typologies:

- *Constant headcount:* on a normal basis there are between 250 and 300 people inside the Microsoft office. This can be seen as the constant demand that needs to be accommodated.
- *Flexible headcount:* above this constant headcount of 250 to 300 people, a flexible headcount can be stated with a peak of around 500 people.

Added value	Supporting image		Support image and attract talent
	Supporting culture		Support culture about changing view on ways of working
	Stimulating collaboration		Contribute in engagement with others
	Stimulating innovation & creativity		Keep up with with technological innovation
	Improving quality of place		
	Controlling risk		
	Decreasing costs		
	Increasing value of assets		
	Supporting user activities		Optimize attention
	Increasing user satisfaction		Improve work-life balance employees
	Increasing flexibility		
	Reducing footprint (m2)		
	Reducing footprint (CO2)		
Occupier space demand	Migratory in		
	Migratory out		
	Flexible headcount		Peak heacount of around 500
	Transitory headcount		
	Constant headcount		Constant headcount between 250 and 300

Figure 6.4.: *Microsoft in-case analysis 'why'*

6.3.1.2. WHAT

Alongside the change in the way of working (demand), the supply has changed as well. In the old situation Microsoft had a total office space of 11.500 square meters of which 9.000 square meters were only accessible for employees and 2.500 square meters were accessible for clients. However, a space utilization research showed an average space utilization of 25% and a peak average attendance of 38%.

Therefore in the new situation Microsoft concluded a contract for only 8.500 square meters and gave 3.000 square meters back to Schiphol Real Estate. From these 8.500 square meters, only 2.500 are for employees and 6.000 are accessible to customers and partners. The office can be divided into three zones: collaboration zone, coworking zone and focus zone.

- *Traditional:* out of the 8.500 square meters, 2.500 are for employees only. This is a secured zone which is divided into three zones: from a busy collaborative hot zone, to a more silent, concentration and relaxation oriented 'cold zone' where silent lounges are located.
- *Open house:* the other 6.500 square meters has been divided in a public and semi-public space. They are accessible to customers, partners and partly to the public. The public part is open for everyone and offers the following facilities: the entrée, a coffee bar and restaurant, 'The stage' is a public space were events can be held, and a variety of work places. The semi-public space is only accessible for customers and partners and offers the following facilities: 'The lab' room to host training courses, 'Customer experience centre' room to interact with clients, 'The holosuite' 5D theatre and 'The domains' office space with rooms for semi-public activities and independent work.
- *Colocated:* The 3.000 square meters which came available after Microsoft gave them back to Schiphol Real Estate were taken up by Spaces. Together with Microsoft they joined forces to create an environment that allows entrepreneurial spirit to thrive and empower anyone to achieve and to contribute more. Spaces Schiphol airport is the new international hub for accelerating innovation within Artificial Intelligence and data-based cloud services and solutions.

  By joining forces and together ensuring more optimal working conditions, a completely new working environment is created. Microsoft makes use of Spaces' proven track record with their pleasant, energetic and inspiring work environments that offers a strong climate of cooperation. In turn, Microsoft provides an innovative environment making their technology available. Together they share services and/or facilities such as reception and catering and other facilities that are located in the public part of the 'open house'.
- *Coworking:* Next to the cooperation at Schiphol, Microsoft has also a corporate membership at Spaces which allows all Microsoft employees to work at all Spaces offices. Alongside this corporate membership, Microsoft pays an extra fee for each time an employee makes use of a Spaces workplace (pay per use).

  A footnote that needs to be mentioned is the fact that for now Spaces is mostly located in Amsterdam (5 locations besides Schiphol), except from one office in Rotterdam and one in The Hague. Therefore, this is mostly an option for the employees in and around Amsterdam and not for all employees working in the rest of the Netherlands. In addition, this is also the location of their own head office. Spaces is working on a geographical expansion in the future that might allow the possibility for employees from other regions to work in their facilities as well.

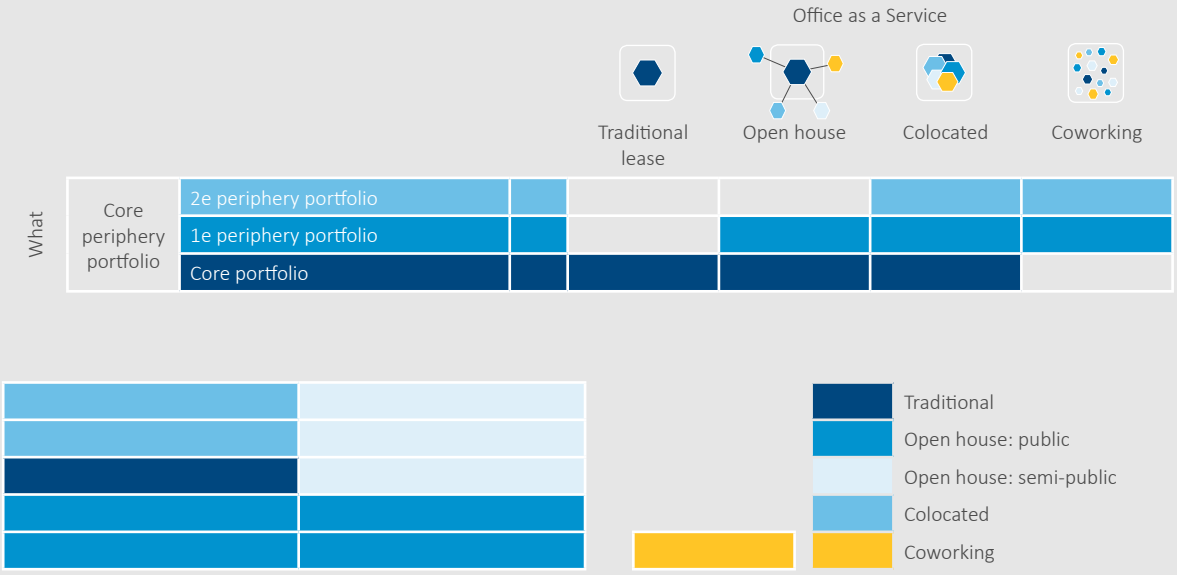


Figure 6.5.: Microsoft in-case analysis 'what'

6.3.1.3. WHY-WHAT

Now that both the 'why' and 'what' are defined, the relationship between both of them can be made to understand how the different strategies are serving the demand objectives.

Added values

In relation to the added values the following 'Office as a Service' solutions are chosen:

- *Supporting image:* Supporting the image and brand of Microsoft cannot be specifically assigned to one strategy but is the combination of the three strategies 'Traditional', 'Open house' and 'Colocated'. Together, this creates an overall solutions that needs to support the image of Microsoft.
- *Supporting culture:* The cultural change is based on a new mindset where customer focus, diversity inclusion and work as one Microsoft are central and supported by the 'six rituals'. These 'six rituals' are based on two main elements: intentional collaboration and attention. Both can be linked to a stand-alone added value: 'stimulating collaboration' and 'supporting user activities'. Therefore, they are also discussed there.
- *Stimulating collaboration:* To stimulate intentional collaboration, Microsoft opened up their office to customers and partners. The demand for collaboration can therefore best be assigned to the strategies: 'Open house' and 'Colocated'.
- *Stimulating innovation:* The demand for innovation can mainly be assigned to the strategy 'Colocated'. Together with Spaces they created a new international hub for accelerating innovation within Artificial Intelligence and data-based cloud services and solutions.
- *Supporting user activities:* To simulate attention, the other main cultural element, different zones are dedicated to concentrated and silent working activities. In addition, relaxation rooms are provided as spaces to recharge. All are located in the 'employee only' part of the office and can therefore be allocated to the 'Traditional lease' strategy.
- *Increasing user satisfaction:* Increasing user satisfaction cannot be specifically assigned to one strategy. This objective is served by the combination of strategies. To increase the user satisfaction, Microsoft gives employees the freedom to choose between multiple workplace possibilities.

Occupier space demand

In relation to the occupier space demand the following 'Office as a Service' solutions are chosen:

- *Constant headcount:* The demand for the 'constant headcount' can be assigned to the three strategies: 'Traditional lease', 'Open house' and 'Colocated'.
- *Flexible occupancy:* The demand for 'flexible occupancy' can be assigned to the three strategies: 'Open house', 'Colocated' and 'Coworking'.

Conclusion

Out of the in-case analysis of Microsoft in relation to the 'why', 'what' and 'why-what' the following conclusion can be drawn: The choice for a combination of all four strategies is based entirely on objectives which can be located on the left side of the Corporate Real Estate Management model focusing on institution.

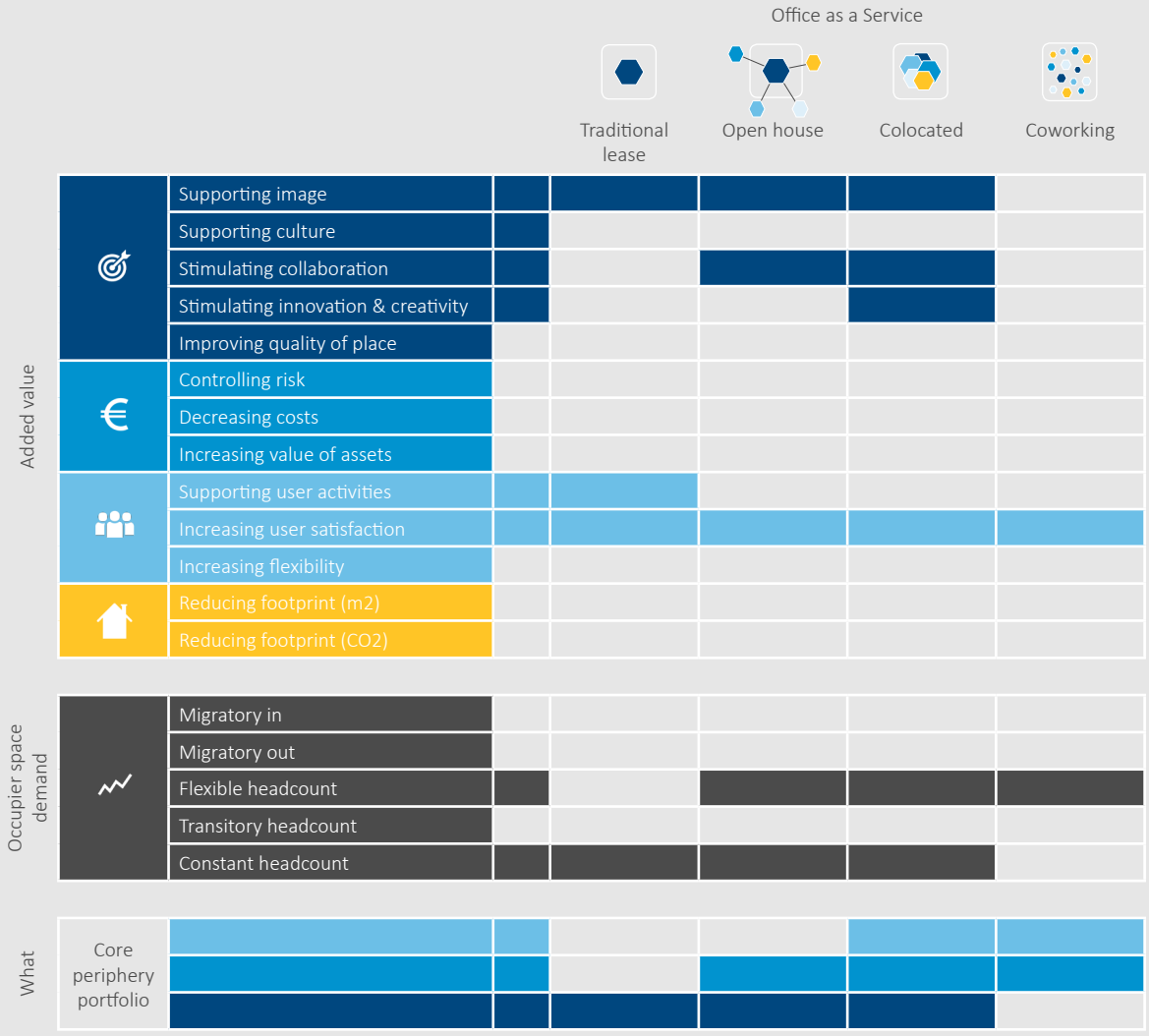


Figure 6.6.: *Microsoft in-case analysis 'why-what'*

Office
The Cloud

Adress
Meester Treublaan 7
Amsterdam Amstel

"We ignite opportunity by setting the world in motion"

6.4. UBER

Uber Technologies is an American multinational transportation network company offering services that include peer-to-peer ridesharing, ride service haling, food delivery, and a bicycle-sharing system. The company is based in San Francisco and has operations in over 785 metropolitan areas worldwide.

Since 2012, Uber's head office for all activities outside the US has been located in Amsterdam. In 2014 the company moved into one of Spaces offices in the Vijzelstraat located in the centre of Amsterdam. At this location the number of employees grew rapidly from 50 to 400. Because Uber wanted to grow in countries where their taxi service were already present and also to other countries, more people and therefore more space was needed. At their former location at the Vijzelstraat the American multinational had no more space to grow. Therefore, in 2017 Uber moved its international head office in Amsterdam to 'The Cloud', the former bank building of Westland-Utrecht at Mr. Treublaan 7 located next to train station Amsterdam Amstel. The space in 'The Cloud' that Uber does not yet use themselves is operated by the flexible office space provider Spaces.

6.4.1. IN-CASE ANALYSIS

6.4.1.1. WHY

As mentioned in the introduction, because Uber wanted to grow in countries where their taxi service were already present and also to other countries, more people and therefore also more space was needed. Their subsequent expansion plan can be translated into a demand for certain added values and a demand for occupier space demand.

Added value

Concerning the intended added values the following added values are stated:

- *Supporting image:* Because Uber wanted to grow in countries where their taxi service were already present and also to other countries, more people were needed. In order to attract talent to support this expansion plan, the new accommodation needed to support the image of the company.
- *Increasing flexibility / controlling risk / reduce footprint (m2):* the expected growth of employees will take place over a period of 10 years. Therefore, the office needed to have the flexibility to accommodate this growth over the period of 10 years. Next to the added value of 'increasing flexibility' this also touches upon the added values of 'controlling risk' and 'reducing footprint (m2)' as it tries to control the financial risk of a possible vacancy arising from a shortage in terms of demand, thereby achieving optimal use of space throughout.

Occupier space demand

On an operational level, the occupier space demand can be translated into the following typologies:

- *Constant headcount:* Since Uber settled in the Netherlands, Uber grew from 50 employees in 2012 to 400 in 2017 at their former office location. For their new location a constant headcount demand of 400 employees needed to be taken into account.
- *Migratory in:* Due to plan to expand, Uber expects to have 1000 employees in Amsterdam in 10 years' time. Looking at the constant headcount of 400 in 2017, this is an expected growth of around 600 employees over 10 years.

Added value	Supporting image		Attract talent
	Supporting culture		
	Stimulating collaboration		
	Stimulating innovation & creativity		
	Improving quality of place		
	Controlling risk		Control financial risk or vacancy
	Decreasing costs		
	Increasing value of assets		
	Supporting user activities		
	Increasing user satisfaction		
	Increasing flexibility		Supply expected growth
	Reducing footprint (m2)		Optimal use m2
	Reducing footprint (CO2)		
Occupier space demand	Migratory in		Expected growth of around 600 employees
	Migratory out		
	Flexible headcount		
	Transitory headcount		
	Constant headcount		Constant headcount of 400 employees

Figure 6.7.: *Uber in-case analysis 'why'*

6.4.1.2. WHAT

The new office building is called “The Cloud”: a 20.000 square-metre multi-tenant office building in the city centre of Amsterdam near Amstel station. Uber signed a lease for a total of 14.600 m² of office space in which Spaces sub-leases 6200 m².

- *Traditional:* Uber rents 8400 m² providing space for staff working in operations, research, marketing, and sales. The office also hosts a team of engineers working on UberEATS food delivery software.
- *Colocated:* Although Uber rents enough space for a thousand employees, it does not yet fully occupy it. Uber has rented space at Spaces from 2014 till 2017, and they will be offering them space at their head office for the next ten years. Is has been calculated that the Spaces location will shrink as Uber grows. “We are a bit like Uber’s harmonica,” says Roordink. “But that is precisely the role that we want to play.”

  For the office operators it was their fourth location in Amsterdam. Based on all developments around Amstel station and Amstelkwartier in combination with their offices in the Zuidas and in the city centre, a new location on the east side of the city was desirable.

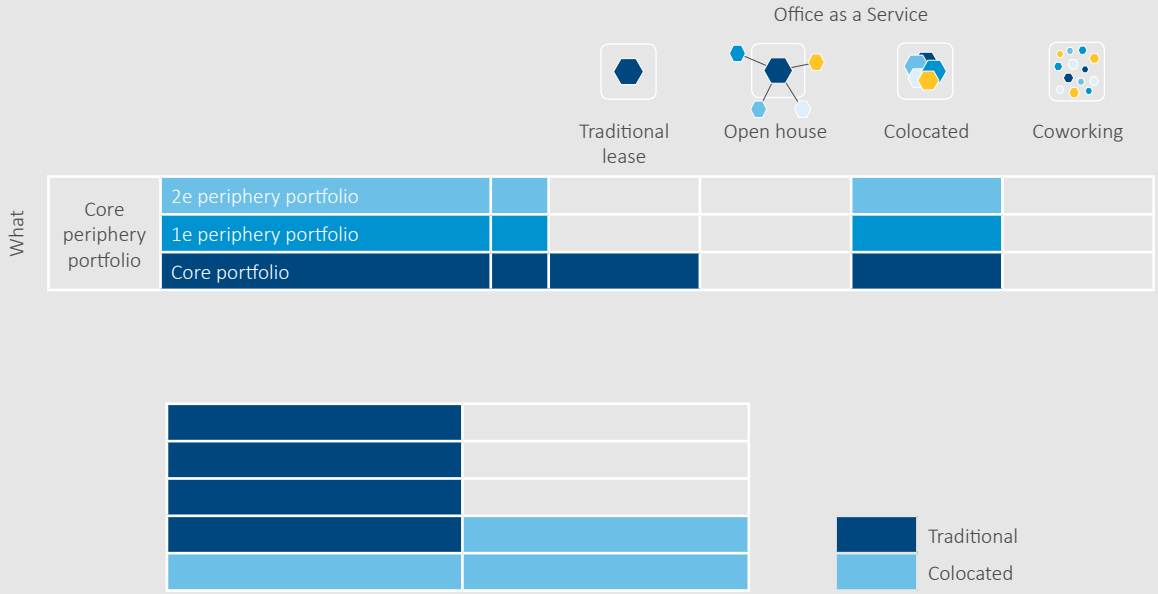


Figure 6.8.: *Uber in-case analysis 'what'*

6.4.1.3. WHY-WHAT

Now that both the 'why' and 'what' are defined, the relationship between both of them can be made to understand how the different strategies are serving the demand objectives.

Added value

In relation to the added values the following 'Office as a Service' solutions are chosen:

- *Supporting image:* Responding to the need to attract talent, Uber has deliberately decided not to look into other cities and countries. As it is a challenge for them to find suitable internationally qualified personnel, due to the growing demand for talent, they wanted to stay in Amsterdam. Amsterdam is major contributor at an attractive business location. The city itself attracts applicants and this is an important driver. "As a European tech hub, Amsterdam has great local and international tech talent, not to mention high living standards and good logistical infrastructure," said Uber's head of Europe, Middle East and Africa, Pierre-Dimitri Gore-Coty.
- *Increasing flexibility / controlling risk / reducing footprint (m2):* the demand for flexibility in relation with controlling risk and reducing footprint (m2) can be assigned to the 'colocated strategy' in which a cooperation has been set up between Uber and the provider of flexible office space: Spaces. According to the three possible cooperation alternatives [§3.4.5.1.], Uber subleases part of the office to the provider of flexible office space.

  This resulted in a solution which adds an flexible layer on top of the traditional office space. This flexible layer can be used in the first place to accommodate the temporary peak demand on top of the constant headcount. But secondly and most important, it facilitates the flexible growth over 10 years' time.

Occupier space demand

In relation to the occupier space demand the following 'Office as a Service' solutions are chosen:

- *Constant headcount:* the demand for the 'constant headcount' can be assigned to the 'traditional strategy'. This initially captures de constant demand for space of 400 employees with a supply of 8400 m^2. As the constant headcount grows over the years, so does the amount of space related to the 'traditional strategy'.
- *Migratory in:* the demand for 'migratory in' can be assigned to the 'colocated strategy'. This captures the flexible growth or peak load over the years as long as this demand not yet can be added to the constant headcount.

Conclusion

Out of the in-case analysis of Uber in relation to the 'why', 'what' and 'why-what' the following conclusions can be drawn: The demand for attracting new talent is not related to the choice for an 'Office as a Service' strategy but is the result of making the right decision regarding the location of the office. The choice for an 'Colocated' strategy, on the other hand, is motivated by the plan to expand, which resulted in a need for more people and therefore also a need for more space. However, as this demand is spread out over a time of 10 years, the supply needed to be flexible to support this future growth, without the financial risk of vacancy and with an optimal use of square meters. Therefore objectives to choose for an 'Office as a Service' strategy can be located on the right side of the Corporate Real Estate Management model focusing on real estate.

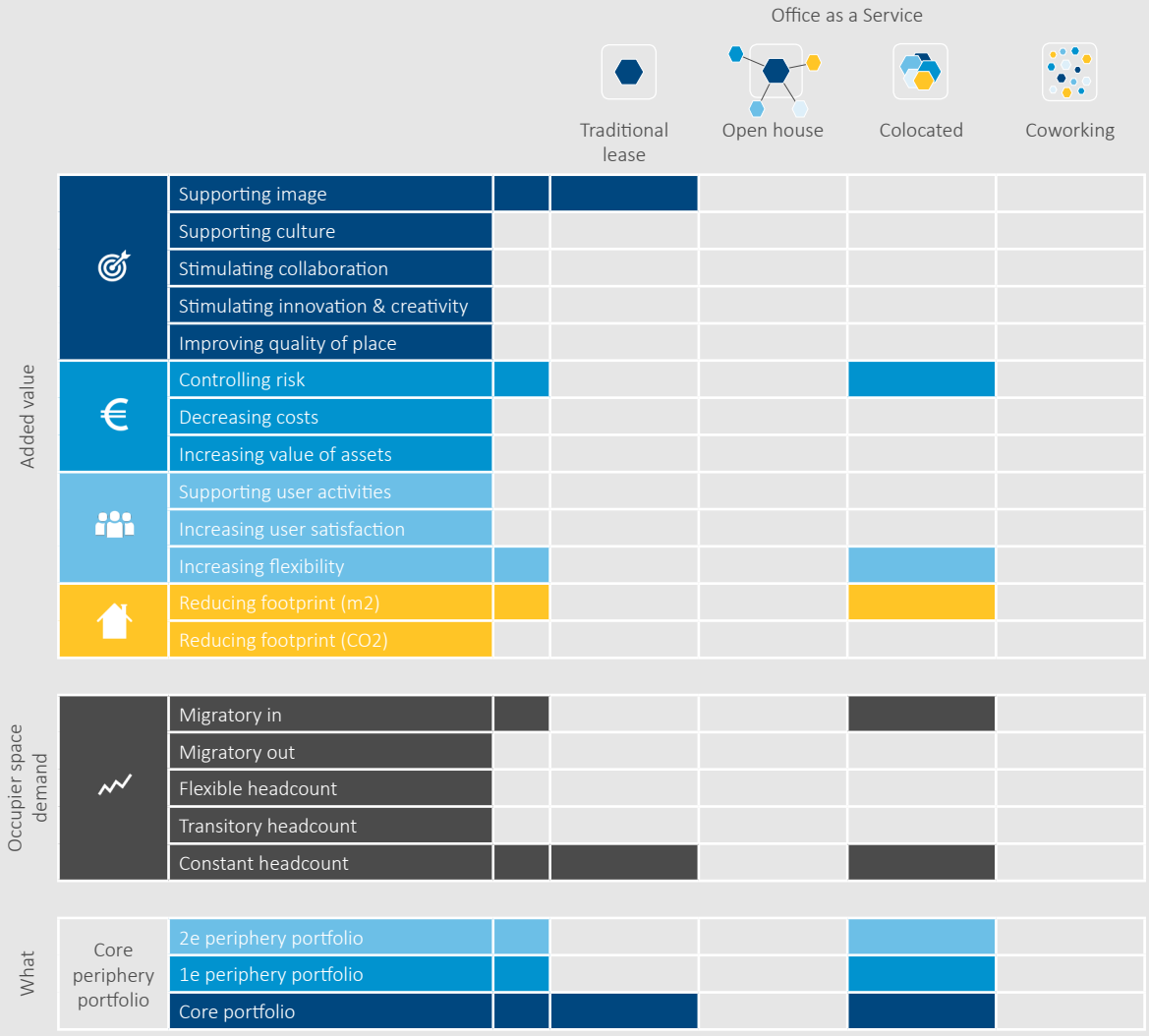


Figure 6.9.: *Uber in-case analysis 'why-what'*

6.5. CROSS-CASE ANALYSIS

The cross-case analysis that is made in the context of the used cross-sectional case study design method is presented in this chapter. The aim of this cross-case analysis is to identify similarities and differences between the outcomes of the in-case analyses. The cross-case analysis is made with the use of a pattern matching technique (Eisenhardt, 1989).

6.5.1. CROSS-CASE ANALYSIS 'WHY'

The cross-case analysis 'why' looks into the similarities and differences related to the added values and occupier space demands between the case studies.

Similarities

Comparing the three case studies, the following similarities can be mentioned:

- All organizations have the objective of 'supporting image'. This can be explained by the fact that all three case studies relate to their headquarters.
- The objective 'stimulating innovation' occurs together with the objective 'stimulating collaboration'. This supports the explanation in sub-chapter 3.2.3. mentioning 'stimulating collaboration' as one of the criteria in 'stimulating innovation'.
- The objective 'controlling risk' occurs together with the objective 'increasing flexibility'. This supports the explanation in sub-chapter 3.2.3. mentioning 'controlling risk' in which 'increasing flexibility' can be of added value.
- All organizations have an occupier space demand in which they make combination between the typology 'constant headcount' and one of the flexible typologies.

Differences

Comparing the three case studies, the following differences can be mentioned:

- According to the theoretical framework of Den Heijer (2011), the objectives of ING and Microsoft focus on institution (demand side) while the objectives of Uber focus on real estate (supply side).
- Uber is the only organization having an objective related to the physical stakeholder perspective (Reducing footprint (m^2)).
- Microsoft is the only organization having the objective 'increasing user satisfaction'.
- The occupier space demand typology on top of 'constant headcount' are different from each other.

Conclusions

Out of the cross-case analysis in relation to the 'why' the following conclusions: Out of the thirteen presumed added values of real estate, nine added values are mentioned as an objective in which the accommodation strategy must contribute. ING and Microsoft focussed on the left side of the CREM model [§3.2.3.], focused on the institution. While Uber focussed on the right side, focused on real estate.

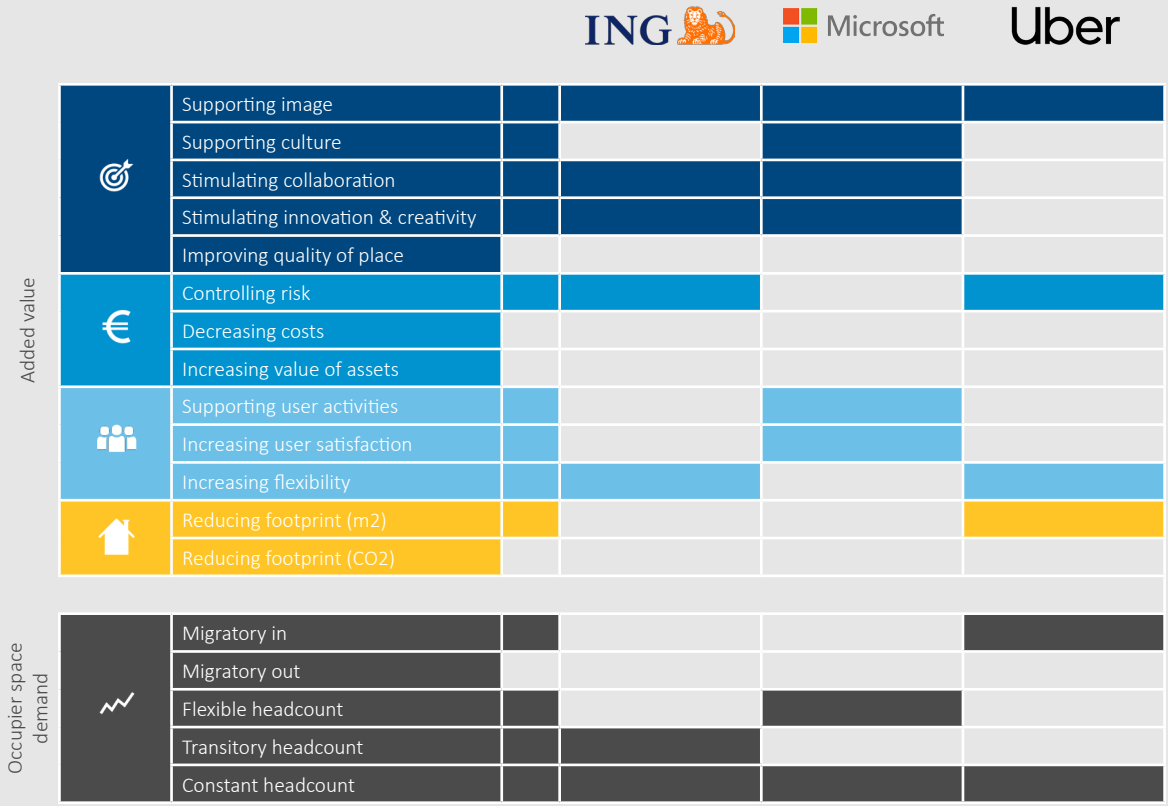


Figure 6.10.: Cross-case anlysis 'why'

6.5.2. CROSS-CASE ANALYSIS 'WHAT'

The cross-case analysis 'what' looks in to the similarities and differences related to chosen 'Office as a Service' strategy in relation to the Core-Periphery model of Gibson and Lizieri (1999).

Similarities

Comparing the three case studies, the following similarities can be mentioned:

- All three organizations use a 'traditional' strategy as an accommodation strategy for their core portfolio.
- The strategy 'colocated' is an accommodation strategy which serves all levels of the portfolio.
- The strategy 'coworking' is only used as an accommodation strategy for the periphery portfolio.

Differences

Comparing the three case studies, the following differences can be mentioned:

-

Conclusions

Taken into account all operational analyses, this results in the following interpretation between the Core-Periphery model of Gibson and Lizieri (1999) and the alternative 'Office as a Service' strategies. This shows a stepwise ascending relationship where the increase of flexibility is answered by a more external strategy of 'Office as a Service'.

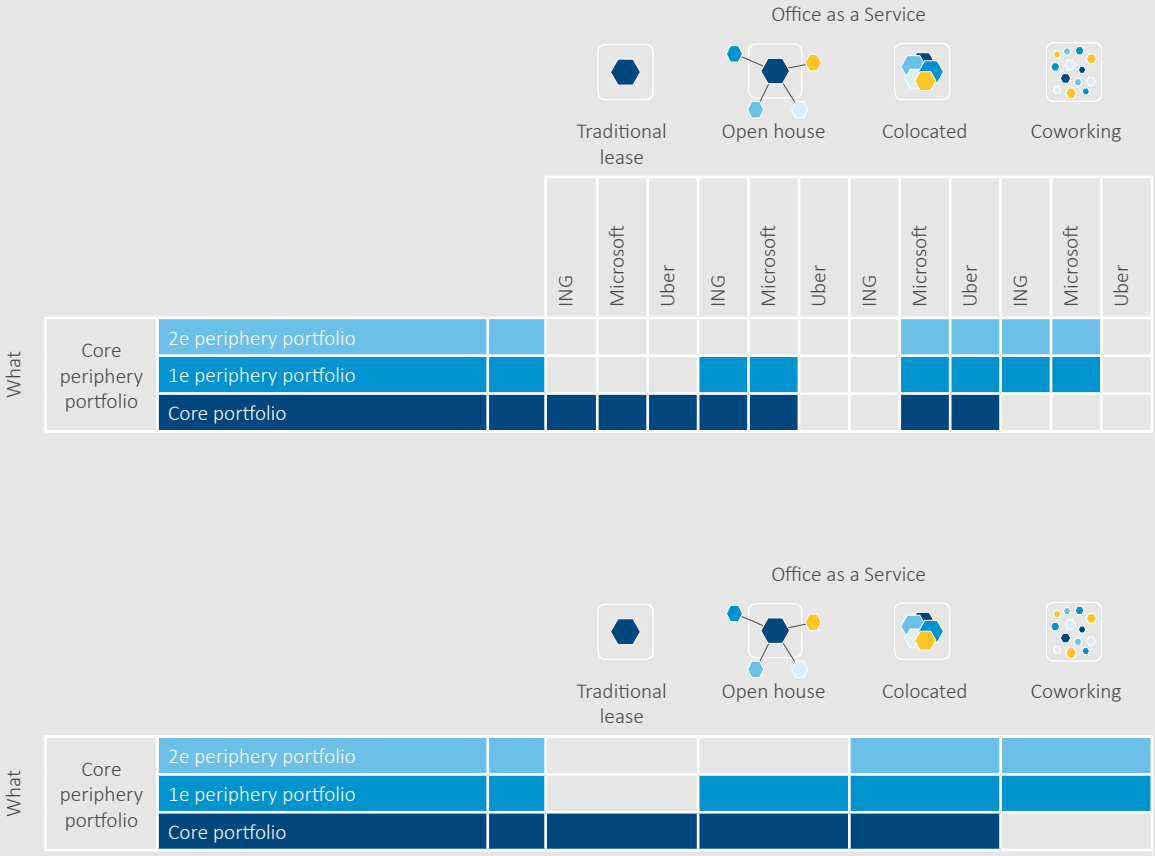


Figure 6.11.: *Cross-case anlysis 'what'*

6.5.3. CROSS-CASE ANALYSIS 'WHY-WHAT'

The cross-case analysis 'why-what' looks into the similarities and differences between the decision-criteria (why) in relation to the chosen 'Office as a Service' strategy (what).

Similarities

Comparing the three case studies, the following similarities can be mentioned:

- For a constant headcount, a 'traditional' strategy is the preferred accommodation strategy and is related to the core portfolio of an organisation.
- An 'open house' strategy contributes to the objectives of 'supporting image' and 'stimulating collaboration'.
- The objective 'controlling risk' occurs together with the objective 'increasing flexibility'. This supports the explanation in sub-chapter 3.2.3. mentioning 'controlling risk' in which 'increasing flexibility' can be of added value. The cross-case analysis (why-what) shows that these objectives are related to an external strategy of 'Office as a Service'.

Differences

Comparing the three case studies, the following differences can be mentioned:

- The objective 'stimulating innovation' occurs together with the objective 'stimulating collaboration'. This supports the explanation in sub-chapter 3.2.3. mentioning 'stimulating innovation' in which 'stimulating collaboration' can be of added value. However, the alternative strategy chosen by ING and Microsoft is different. ING has chosen for 'open house' strategy while Microsoft went for a 'colocated' strategy.

Conclusions

Based on the cross-case analysis (why-what) the following conclusions can be drawn: First, the cross-case analysis (why-what) substantiates the conclusion of the cross-case analysis 'what' [§6.5.3.] that the increase of flexibility is answered by a more external strategy of 'Office as a Service'. Because both added values 'controlling risk' and 'increasing flexibility' are related to an external 'Office as a Service' strategy. And second, the added values from the organizational perspective are more related to an internal 'Office as a Service' strategy.

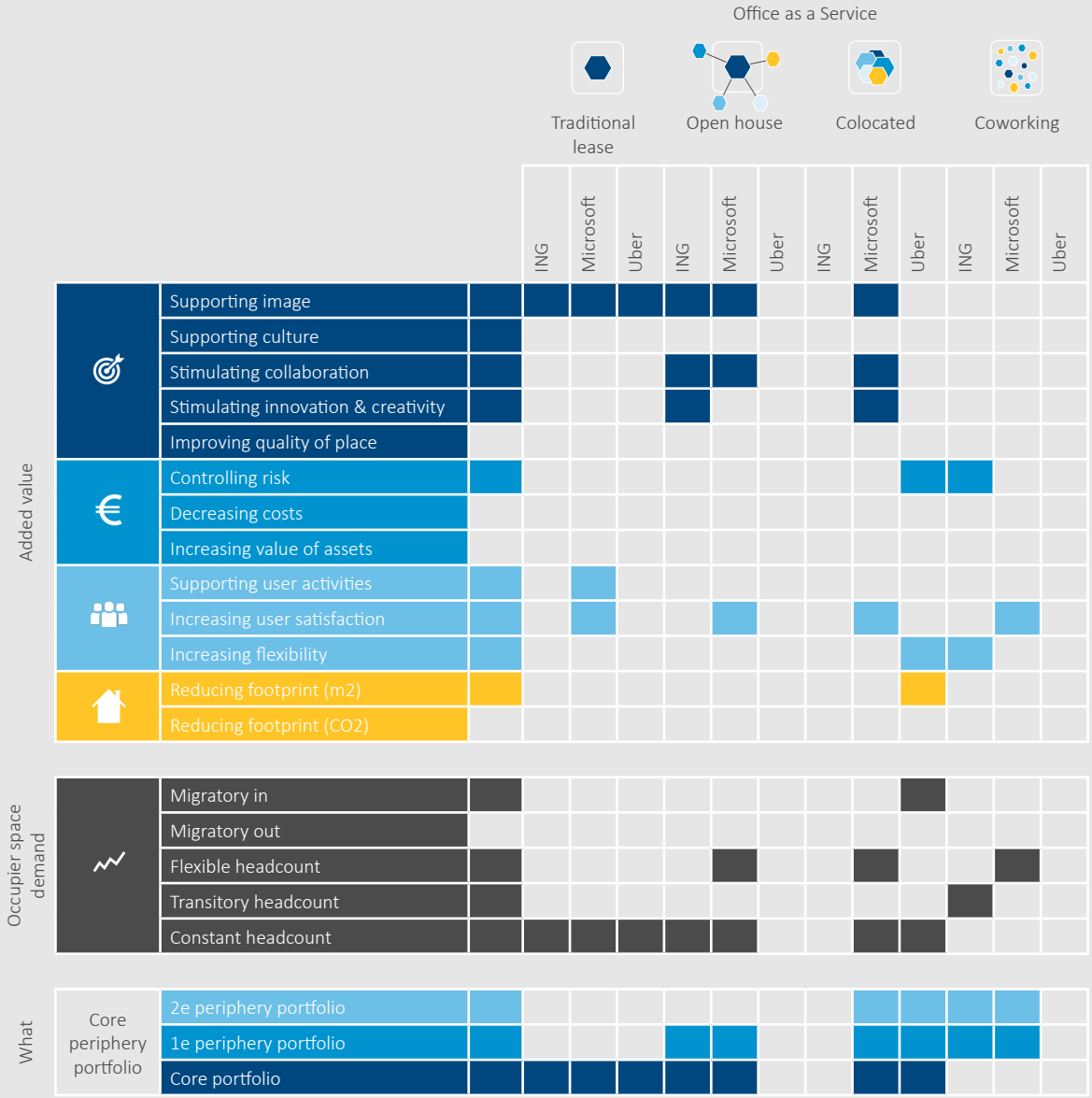


Figure 6.12.: *Cross-case anlysis 'why-what'*

6.6. DEVELOPMENT DETAILED DESIGN

For the development of the detailed design, the empirical findings derived from the case studies are confronted with the preliminary design of the strategic decision approach.

Similarities

Comparing the preliminary design and the empirical findings derived from the cross-case analysis, the following similarities can be mentioned regarding the development of the detailed design:

- In both the preliminary design and the empirical findings derived from the case studies the added value 'Supporting image' is assigned to an internal 'Office as a Service' strategy.
- The added values 'improving quality of place', 'increasing value of assets' and 'Reducing footprint (CO2)' are also after the cross-case analysis not mentioned. Therefore, for the development of the detailed design they will not be taken into account.
- In both the preliminary design and the empirical findings derived from the case studies the added values 'controlling risk' and 'increasing flexibility' occur together and are assigned to a external 'Office as a Service' strategy as a most suitable solution. This once again [§6.5.1.]. substantiates the explanation in sub-chapter 3.2.3. mentioning 'controlling risk' in which 'increasing flexibility' can be of added value.
- The cross-case analysis 'what' showed a stepped ascending relationship between the Core-Periphery model of Gibson and Lizieri (1999) where the increase of flexibility is answered by a more external strategy of 'Office as a Service'. This corresponds with the preliminary design in which the occupier space demand typologies 'flexible occupancy' and 'transitory headcount' show the same relationship.

Differences

Comparing the preliminary design and the outcome of the out of the cross-case analysis, the following differences can be mentioned regarding the development of the detailed design:

- The added value 'supporting user activities' is appointed once in the case study of Microsoft [§6.3.2.]. However, this is related to the demand to optimize attention. Despite being included under the 'traditional' strategy, the creation of a concentration zone cannot be assigned to a 'Office as a Service' strategy. This corresponds to the preliminary design in which the added value 'supporting user activities' is not appointed to an 'Office as a Service strategy' [§5.2.1.]. Therefore, for the development of the detailed design the added value 'supporting user activities' will not be taken into account.
- The added value 'increasing user satisfaction' is appointed once in the case study of Microsoft [§6.3.2.]. While the preliminary design does net yet include this added value. Although supported by a combination of 'Office as a Service' strategies, which offers the possibility for Microsoft employees to make their own choice at which location they want to work, it could be argued that the empirical findings are based on a very small sample size to incorporate 'increasing user satisfaction' into the development of the detailed design. However, future research could provide insight into this connection.
- Regarding the added value 'stimulating innovation' the preliminary design and the empirical findings derived from the case studies differ from each other. Within the case studies both an internal and external strategies are chosen while the preliminary design prefers a 'coworking' strategy. This difference supports the different views on how innovation can be realized. Some prefer a more controlled environment with planned encounters while others choose for an uncontrolled environment with unplanned encounters. This difference in understanding is supported by literature indicating that 'stimulating innovation' can be achieved by both planned and unplanned encounter [§3.2.3.]. For the development of the detailed design no distinction will be made between the different strategies, except for a 'traditional' strategy. As 'stimulating innovation' can be related to (un)planned encounters, the strategies 'open house', 'colocated' and 'coworking' are preferred over 'traditional' because the chance on (un)planned encounters will be increased due to the presence of different users or user groups.

Conclusion

The detailed design of the 'strategic decision approach' is the result of the integration of the data out of the literature study translated into a conceptual model [§4.3.], the interviews translated in a preliminary design [§5.3.] and the cross-case study. The detailed design of the 'strategic decision approach' takes into account eight added values, divided over all four stakeholders perspectives and five occupier space demand typologies where the increase of flexibility is answered by more external 'Office as a Service' strategy.

6.7. DETAILED DESIGN

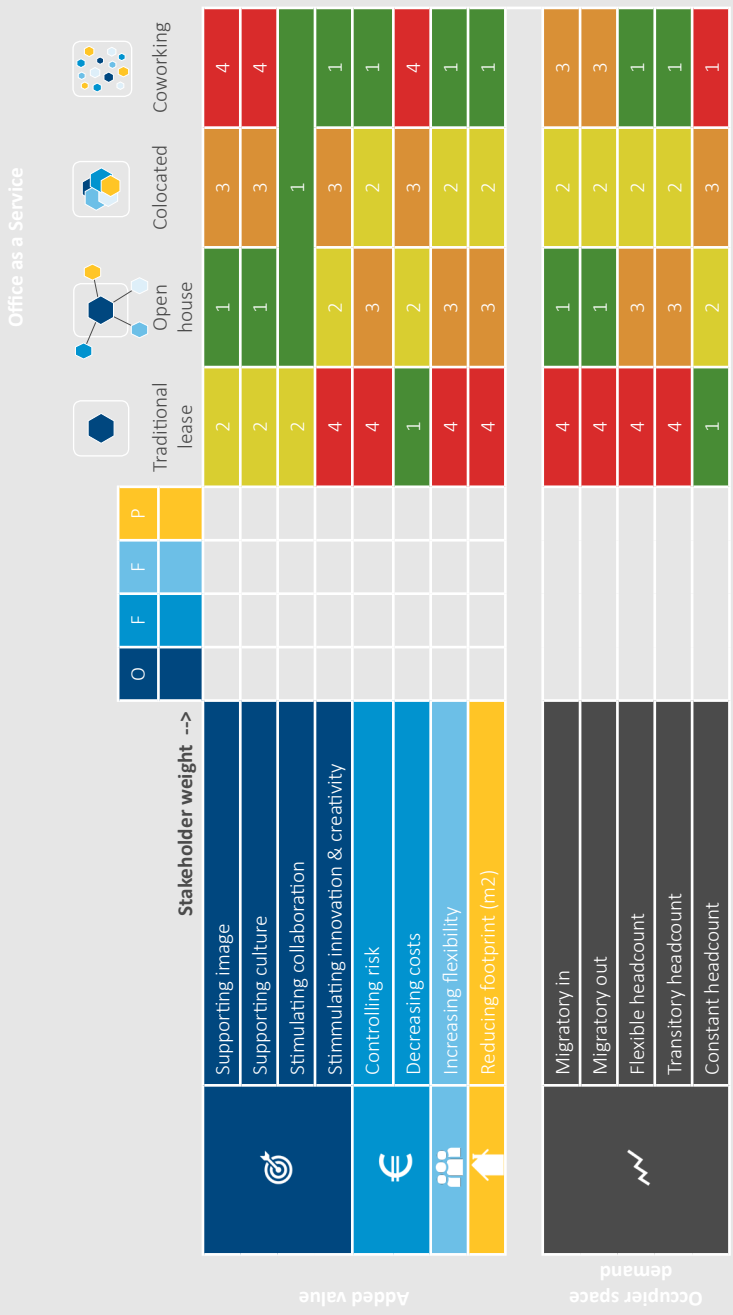


Figure 6.13.: Detailed design


1

CONCLUSION

7

7. CONCLUSION

The aim of this chapter is to come to conclusions, which are developed in response to the five research sub-questions and the main research question. This is done in the first section of this chapter. A discussion on these conclusions is presented in the second section of this chapter in which the limitations of this research are discussed together with the validity and general applicability of this research.

7.1. ANSWERING THE RESEARCH QUESTION

In the beginning of this research the following research objective was stated: the research objective of this graduation work is to develop and present knowledge about how the physical resource can be enhanced by implementing 'Office as a Service'. Because the mismatch is dynamic and will change frequently, a strategic decision approach to managing the mismatch between the user organisation and the building is proposed. In order to achieve this research objective the following main research question was stated: "How can 'Office as a Service' be a strategic decision approach for an organisation to optimize their physical resources in order to obtain maximum added value?" Before answering the main research question, the conclusions of the sub-questions are presented.

7.1.1. PART A 'INPUT'

The first step in answering the main research question is elaborating upon terms that are used in the problem statement, research objective and main research question. This research touches upon three relevant topics: Real Estate Management, Decision Support Systems and 'Office as a Service'.

Research sub-question 1:

Question	What theories and concepts apply to Real Estate Management?
Objective	Understanding of the principles of Real Estate Management
Method	Literature study

The basis of real estate management is the presumed added value of real estate on performance, either negative or positive. Referred to as the fifth resource for an organisation, real estate has thirteen objectives through which the physical resources can add value to the organisation. Based on the Corporate Real Estate Management model, these thirteen presumed added values can be divided over the four perspectives of stakeholders which all serve different performance criteria.

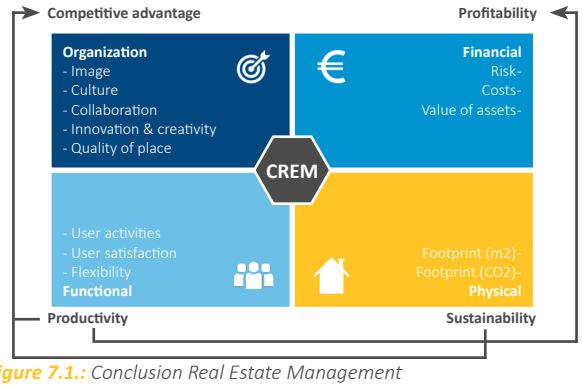


Figure 7.1.: Conclusion Real Estate Management

Research sub-question 2:

Question	What theories and concepts apply to Decision Support Systems?
Objective	Understanding of the principles of Multi-Criteria Decision Analysis
Method	Literature study

Decision-making in the field of (corporate) real estate management requires multiple objectives. These objectives are often conflicting and come from stakeholders driven by various goals. For this reason, the concept of Multi-Criteria Decision Analysis is introduced to support the decision-making process by taking explicit account of multiple criteria to make the most suitable decision. With this approach, the alternatives are assessed against the defined criteria to choose the most suitable solution forward. They make use of weights and preferences to come to the optimal solution.

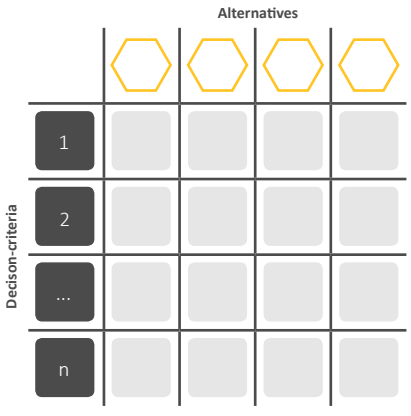


Figure 7.2.: Conclusion Decision Support Systems

Research sub-question 3:

Question	What theories and concepts apply to Office as a Service?
Objective	Understanding of the principles of Office as a Service
Method	Literature study

'Office as a Service' is based on the underlaying theories of servitization and product-service-systems. A serviced office is defined as space within a building that is let, sub-let or licensed to third parties on a serviced basis. The services comprise all of the building services and a menu of business support services. 'Office as a Service' can be analysed in line with the management levels of Joroff et al. (1993): strategic, tactical and operational. This includes four alternative strategies, three tactical solutions and three groups of variables out of which a Product-Service-System is built upon: product variables, services variables and general variables.

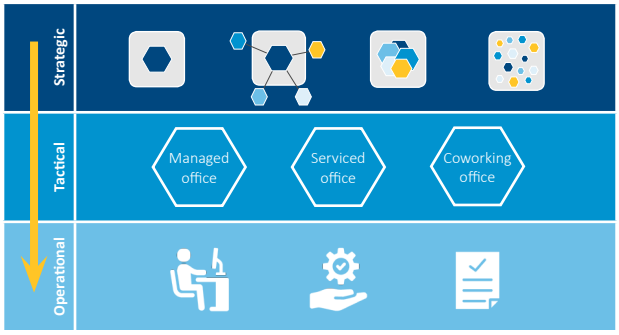


Figure 7.3.: Conclusion 'Office as a Service'

7.1.2. PART B 'THROUGHPUT'

The second part in answering the main research question develops the strategic decision approach based on the theoretical input of part A.

Research sub-question 4:

Question	How to develop a strategic approach for Office as a Service?
Objective	Development of the conceptual design of the strategic approach
Method	Design based on empirical input out of the literature study

The development of the conceptual design is based on the integration of the established specifications that emerged from the literature study related to the following bodies of knowledge: Real Estate Management, Decision Support Systems and 'Office as a Service'. According to the second phase of a Multi-Criteria Decision Analysis process, this sub-question focused on 'model building' and 'model use'.

Model building

To build the 'strategic approach' the formal procedure of a MCDA is used:

- *Specification of alternatives:* The alternatives that are taken into account are based on the established specifications of 'Office as a Service' concerning the four 'Office as a Service' strategies as well as the three 'Office as a Service' solutions.
- *Defining the decision-makers criteria:* The decision-makers criteria that are taken into account are based on the established specifications of Real Estate Management concerning the four stakeholder perspectives with their related presumed added values.
- *Rating the decision-maker preference for each alternative in relation to each criterion:* rating the alternatives on the decision-maker criteria will take place in step 5 of the research design.
- *Assigning the decision-maker weight to each criterion:* related to the decision-makers criteria, each stakeholder perspective can give their preference. Next to that each stakeholder perspective can be given a decision-weight in the decision process.

Model use

The use of the 'strategic decision approach' is related to the third step of the 'Designing an Accommodation Strategy' framework: Weigh and select alternatives (to create future real estate supply for the organization). Translating this step into the use of the 'strategic decision approach' the following steps are required:

- *Determine future demand:* the future demand is determined by having the four stakeholder perspectives determine their preferences/objectives in combination with a given decision-weight per stakeholder perspective.
- *Design alternatives:* the alternatives are already designed and are based on the established specifications of 'Office as a Service' concerning the four 'Office as a Service' strategies as well as the three 'Office as a Service' solutions.
- *Weigh and select alternatives:* rating the alternatives on the decision-maker criteria will take place in step 5 of the research.
- *Determine future supply:* Based on the chosen objectives with corresponding decision-weight per stakeholder perspective, a total score can be calculated per alternative to determine the optimal solution.

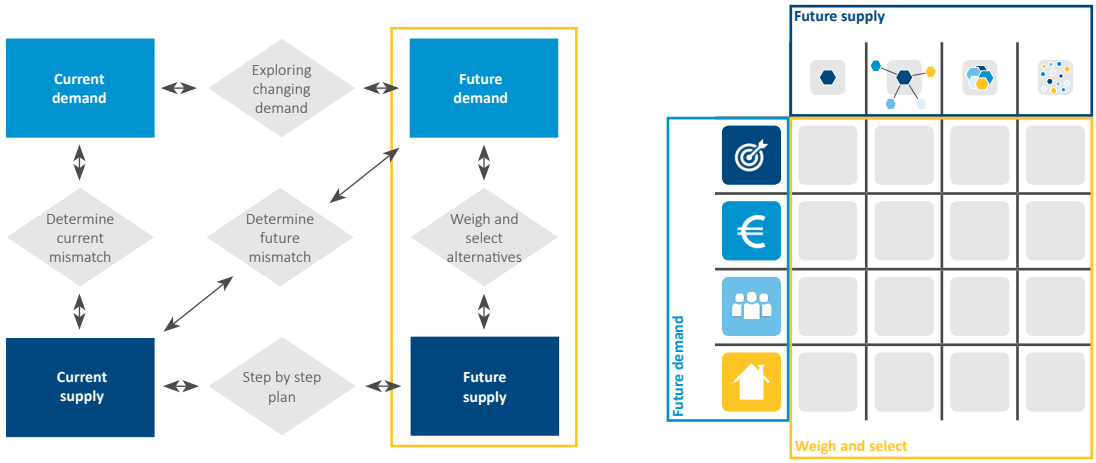


Figure 7.4.: Development conceptual design

Research sub-question 5:

Question	How can decison-making tools be evaluated?
Objective	To verify, supplement and refine the first conceptual design of the 'strategic approach'
Method	Semi-structured interviews

To verify, supplement and refine the conceptual design which was based on literature research (step 3). The data derived from the interviews was categorized according to the defined decision-makers criteria (why), the specification of alternatives (what) and the relationship between them (why-what).

Why

Added value

The verification, supplementation and refinement of the thirteen presumed added values was analysed according to the following two criteria:

- Present in relation to 'Office as a Service': Yes or No
- Which Key Performance Indicator(s) can be used to rate the different 'Office as a Service' strategies?

Out of the first thirteen presumed added values that are taken into account as an input for the conceptual design, eight added values can be related to the concept of 'Office as a Service'. These eight added values, with their corresponding Key Performance Indicators, are included in the development of the preliminary design. The remaining five added values are, although not related to 'Office as a Service', not yet removed out of the design of the 'strategic decision approach'. This is because these added values may still be mentioned in the next research step and are still useful for the development of the 'strategic decision approach'.

Occupier space demand

Although the conceptual design of the strategic decision approach takes into account the added value which contributes to the strategic goals of an organisation, the operational space utilization to optimize the supply-demand relationship is not taken into account. Applying the core/non-core concept to the corporate real estate portfolio, Gibson and Lizieri (1999) developed the Core-Periphery operational real estate portfolio space model. Therefore, alongside the added values, five typologies of occupier space demand are added to the decision-makers criteria:

- Migration in
- Migration out
- Flexible occupancy
- Transitory project
- Constant demand

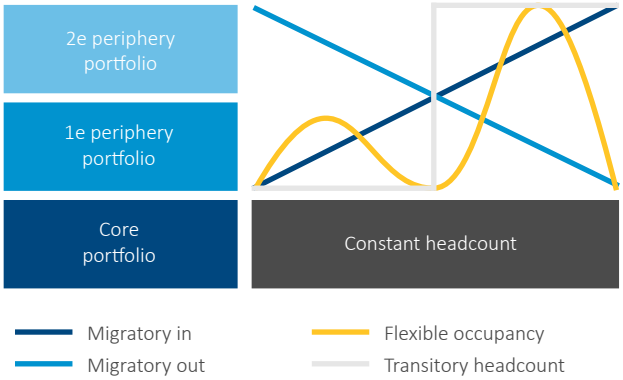


Figure 7.5.: Occupier space demand vs Core-Periphery model

What

Based on the alternatives that are taken into account as an input for the conceptual design, the three tactical solutions of 'managed office', 'serviced office' and 'coworking office' are evaluated. Arsing from this evaluation in relation to the development of the preliminary design, the choice has been made to focus on the strategic alternatives and to keep the tactical alternatives as a recommendation for future research.

Why-what

Based on the eight related added values with their corresponding KPI and the five occupier space demand typologies, the four 'Office as a Service' strategies are rated against each other from 1 to 4. In which 1 is the preferred option in relation to the decision-criteria.

Figure 7.6.: Input preliminary design

			Office as a Service			
			Traditional lease	Open house	Colocated	Coworking
Added value	Supporting image		2	1	3	4
	Supporting culture		2	1	3	4
	Stimulating collaboration		4	2	3	1
	Stimulating innovation & creativity		4	2	3	1
	Improving quality of place					
	Controlling risk		4	3	2	1
	Decreasing costs		1	2	3	4
	Increasing value of assets					
	Supporting user activities					
	Increasing user satisfaction					
	Increasing flexibility		4	3	2	1
	Reducing footprint (m2)		4	3	2	1
	Reducing footprint (CO2)					
Occupier space demand	Migratory in		4	1	2	3
	Migratory out		4	1	2	3
	Flexible headcount		4	3	2	1
	Transitory headcount		4	3	2	1
	Constant headcount		1	2	3	4

Research sub-question 6:

Question	How is the strategic approach related to practice?
Objective	Link this research to practice there this research opts to solve real-life problems
Method	Case-study research: semi-structured interviews, documentation

Since this research opts to solve real-life problems, the link of this research to practice took place by a cross-sectional case study design. This included three in-case analyses after which a cross-case analysis was made between the three.

IN-CASE ANALYSIS

The aim of the in-case analyses was gaining data regarding their intended demand, both on added values and on occupier space demand, their chosen 'Office as a Service' strategy in relationship to the Core-Periphery model of Gibson and Lizieri (1999) and finally the relationship between their demand and supply.

The three case studies that were used to gather this data were: ING with the development of their new international headquarters in the Bijlmerdreef in the southeast of Amsterdam, Microsoft with the renovation of their office at Schiphol and Uber with their new office close to Amsterdam Amstel.

CROSS-CASE ANALYSIS

A cross-case analysis was made in order to learn from the conducted case studies. With this cross-case analysis, the data derived from the case studies was categorized according to the defined decision-makers criteria (why), the specification of alternatives (what) and the relation between them (why-what). Hereafter a pattern matching technique is used to identify similarities and differences.

The cross-case analysis showed:

- That out of the thirteen presumed added values of real estate, nine added values are mentioned as an objective in which the accommodation strategy must contribute. ING and Microsoft focussed on the left side of the CREM model, focused on the institution. While Uber focussed on the right side, focused on real estate.
- That based on the occupier space demand typologies, this results in the following interpretation between the Core-Periphery model of Gibson and Lizieri (1999) and the alternative 'Office as a Service' strategies: a stepped ascending relationship where the increase of flexibility is answered by a more external strategy of 'Office as a Service'.

DEVELOPMENT DETAILED DESIGN

For the development of the detailed design, the empirical findings derived from the case studies were confronted with the preliminary design of the strategic decision approach. This resulted in a detailed design of the 'strategic decision approach' that takes into account eight added values, divided over all four stakeholders perspectives and five occupier space demand typologies where the increase of flexibility is answered by more external 'Office as a Service' strategy..

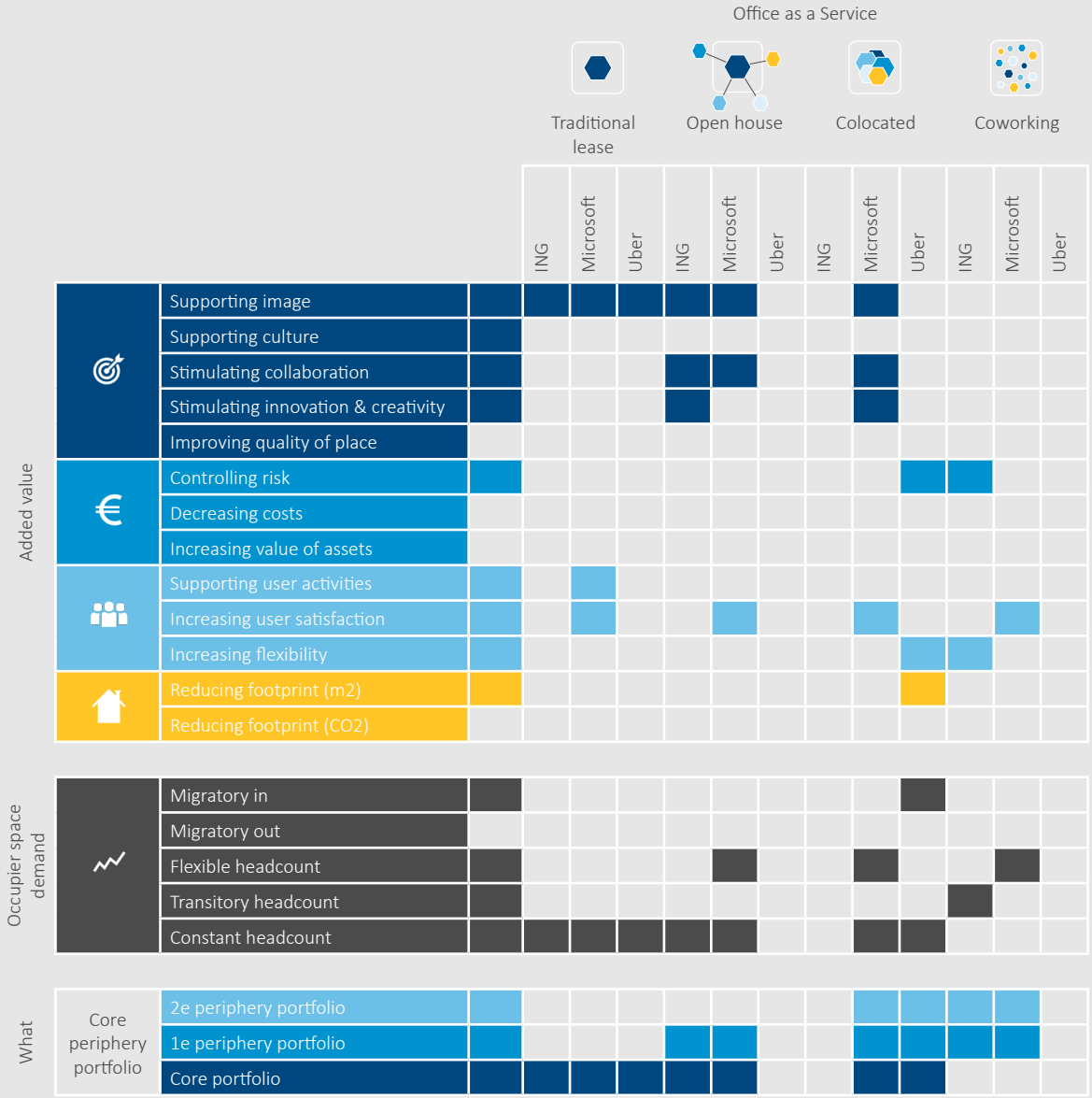


Figure 7.7.: Cross-case anlysis

7.1.3. PART C 'OUTPUT'

The theoretical input of part A and the data collection and analysis of part B will be used to deliver the insights for answering the main research questions and come to conclusions.

Main research question:

Question	How can 'Office as a Service' be a strategic decision approach for an organisation to optimize their physical resources in order to obtain maximum added value?
Objective	Develop and present knowledge on how 'Office as a Service' can be a strategic decision approach for an organisation to optimize their physical resources in order to obtain maximum added value?
Method	Explorative operational-empirical research

In order to answer the main research question: "How can 'Office as a Service' be a strategic decision approach for an organisation to optimize their physical resources in order to obtain maximum added value", a strategic decision approach is developed based on the concept of a Multi-Criteria Decision Analysis (MCDA) model.

The development of this Multi-Criteria Decision Analysis model integrates the decision-makers criteria, which are based on the presumed added values of real estate as well as the five typologies of occupier space demand, with the alternative 'Office as a Service' strategies.

Added values

Based on the model of Den Heijer (2011) to assess the added value of real estate decisions regarding the four stakeholder perspectives with their corresponding presumed added values, nine added values divided over all four stakeholder perspectives can be related to the concept of 'Office as a Service'

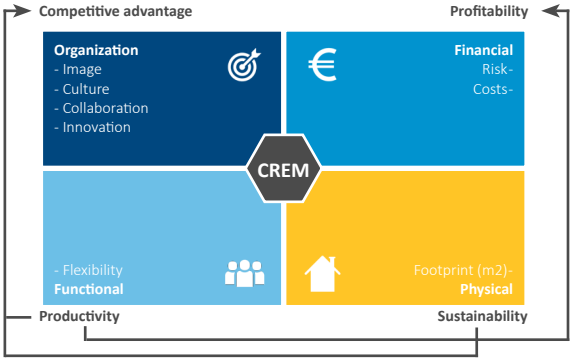


Figure 7.8.: Added values 'Office as a Service.

Occupier space demand

Next to the presumed added values of real estate which contribute to the strategic goals of an organization, an operational aspect is added to the decision-criteria taking into account five typologies of occupier space demand of an organisation. Based on the Core-Periphery operational real estate portfolio space model of Gibson and Lizieri (1999) in relation to the alternative 'Office as a Service' strategies this results in the following interpretation: a stepped ascending relationship where the increase of flexibility is answered by a more external 'Office as a Service' strategy.

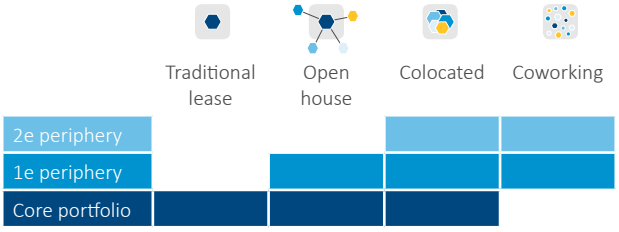


Figure 7.9.: Core-Periphery vs 'Office as a Service.

The integration of both groups of decision-makers criteria leads to the following result: A strategic decision approach to 'Office as a Service' that can be used by organizations to optimize their physical resources in order to obtain maximum added value. The strategic decision approach to 'Office as a Service' is depicted in figure 7.10..

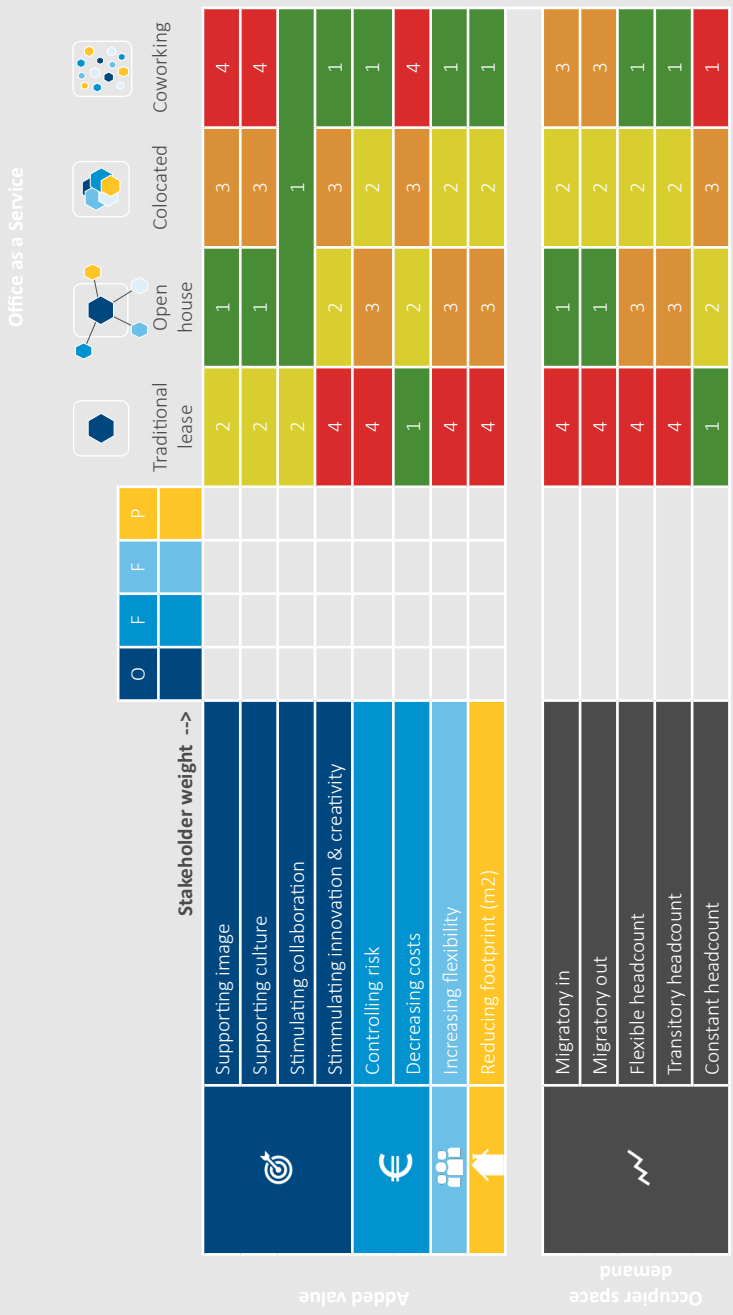


Figure 7.10.: Strategic decision approach 'Office as a Service'

7.2. Discussion

The outcomes of this research are discussed in this section. The main topics that will be elaborated on are: relationship between outcome and existing theories, relationship between the outcome and practice, the limitations, validity and generalizability of the results of this research.

7.2.1. DISCUSSION ON THEORY

The literature study of this graduation research builds upon multiple bodies of knowledge linked to the conceptual model: Real Estate Management, Decision Support Systems and 'Office as a Service'. The relationship between the outcomes of this research and the outcomes of the literature related to these three subjects are discussed.

Real Estate Management

In this research the thirteen added values, based on research of Valks, Arkesteijn and Den Heijer (2018), were related to the theoretical framework of Den Heijer (2011) and used as an input for the development of the 'strategic decision approach'. With the development of the detailed design, eight added values were found to be related to the concepts of 'Office as a Service'. Though, despite the fact that the other five added values are not taken into account, this does not prove that they are not related to the concept of 'Office as a Service'. However, the data obtained from the interviews and case studies did not provide any or effective evidence to take them into account.

In addition to the discussion on the theory regarding added value, in both the preliminary design and the empirical findings derived from the case studies, the added values 'controlling risk' and 'increasing flexibility' occur together. These results substantiates the explanation in sub-chapter 3.2.3. regarding 'controlling risk' in which 'increasing flexibility' can be of added value. This also applies to the added values 'stimulating collaboration' and 'stimulating innovation'. In which 'stimulating collaboration' can be of added value to stimulate innovation.

Decision Support Systems

For the development of the 'strategic decision approach' the concept of a Multi-Criteria Decision Analysis model is used. This Multi-Criteria Decision Analysis model integrates the decision-makers criteria, which are based on the presumed added values of real estate as well as the five typologies of occupier space demand, with the alternative 'Office as a Service' strategies. Based on the decision-makers criteria, the four alternative 'Office as a Service' strategies are rated in relation to each other from 1 to 4. In which 1 is the preferred option on basis of the decision-criteria.

However, a critical note can be placed on the ordinal way of ranking. By only using the numbers 1, 2, 3 and 4 a distorted image can arise on the actual performance of an alternative strategy. For example, the difference in performance between alternative 1 and alternative 2 does not have to be as large as the difference in performance between alternative 2 and alternative 3. By using this ordinal way of ranking, the decision model determines the most desirable solution where the possibility may arise that a better solution is available.

'Office as a Service'

The cross-case analysis 'what' showed a stepped ascending relationship between the Core-Periphery model of Gibson and Lizieri (1999) and the alternative 'Office as a Service' strategies: where the increase of flexibility is answered by a more external strategy of 'Office as a Service'. These results confirm the association made by Laing (2018), illustrated in figure 3.9., in which he arranged the typologies 'open house', 'cohabit' and 'coworking' in the same way. According to the increase of flexibility.

7.2.2. DISCUSSION ON PRACTICE

The findings from the different elements of the empirical part of this research are discussed in this paragraph.

Outsourcing

As mentioned by Dabson and McAllister (2014) [§3.4.3.], the concept behind 'Office as a Service' is based on the same principles as other forms of outsourcing, namely the conversion of fixed costs to variable costs and the transfer of risk to another party. Despite these principles, according to the empirical findings derived from the case studies these are not the main reasons to make use of an 'Office as a Service' concepts.

Coworking vs organisational perspective

According to the empirical findings, what stands out is that the 'coworking' strategy is not used for added values related to the organization perspective. Despite the fact that 'stimulating innovation' and 'stimulating collaboration' are one of the main selling points by the various office operators. A possible explanation that can be used to explain this result, stems from the lack of demonstrable evidence in relation to these added values.

7.2.3. LIMITATIONS, VALIDITY AND GENERALIZABILITY OF RESULTS

As stated in the sub-chapter research design [§2.1], the nature of this study has a explorative nature due to a gap in previous research on this topic. This means that there is a limited qualitative body of knowledge to start from. As a result, a qualitative hybrid research method is used whereby a combination of semi-structured interviews and case studies is used to create the strategic decision approach.

Limitations

Concerning the limitations of this research the following five points of attention can be mentioned:

- *Sample size:* The empirical finding of this research are derived from three case studies. Although multiple case studies are used, their used 'Office as a Service' strategies are different. It could be argued that the empirical findings are therefore based on a very small sample size. The credibility of the outcomes of this research can be increased by increasing the sample size.
- *Type of organisation:* The empirical findings of this research are derived from three organizations. However, all three are private organisations that can be classified as full-grown multinationals with a minimal workforce of 400 employees to accommodate. Empirical research regarding organizations of a different scale, and/or with a different focus, and/or with a different degree of maturity could show a different outcome.
- *Type of office:* The empirical findings of this research are derived from three case studies which mainly focus on their (international) headquarters. Empirical research regarding different typologies of offices could show a different outcome.
- *Intended demands:* The empirical findings of this research are derived from 'intended' added values in relation to the chosen 'Office as a Service' strategy. Both Microsoft and ING were in progress of implementing their strategy. As a result, it cannot yet be proven that the chosen strategy or strategies lead to the intended result.
- *Operational decision model:* With the development of the 'strategic decision approach' a decision model is developed that shows the relationship between the different decision-criteria (demand) and the 'performance' of the alternative 'Office as a Service' strategies. However, this research has not yet tested and evaluated the operational usability of the model for the user, but used the case studies to strengthen the input of the model.

Validity and generalizability of the results

Concerning the validity and generalizability the following three point of attention can be mentioned:

- *Construct validity:* Refers to "(…) the accuracy with which a case study's measures reflect the concepts being studies" (Yin, 2014, p.238). As mentioned in the research proposal [§1.4], the aim of this research is to develop and present knowledge of how the physical resource can be enhanced by implementing 'Office as a Service'. In order to operationalize the relationship between demand and supply, a Multi-Criteria Decision Analysis framework is developed. This framework is based upon a literature review about the presumed added values of real estate as defined by Valks, Arkesteijn and Den Heijer (2018) with the occupier space demand typologies as defined by Gibson & Lizieri (1999) on the demand side. On the supply side the alternative strategies of 'Office as a Service' are used.
- *Internal validity:* Relates to the question "(…) whether a finding that incorporates a causal relationship between two or more variables is sound" (Bryman, 2012, p.712). Due to the social nature of the research by performing a qualitative research, it can occur that the data analysis, collected out of the semi-structured interviews and case studies, is biased. As a result, there is the risk that the researcher's observations and interpretations of the data collected are causing subjectivity, information allocation and misinterpretation of the collected data. Both would affect the internal and external validity of the results. The attempt has been made to minimalize this by setting up an interview and case study protocol as a general guideline. In this research causalities were sought between the decision-criteria related to the presumed added values and typologies of occupier space demand with the alternative 'Office as a Service' strategies. In order to enhance the internal validity of the findings
- *External validity:* Concerns "the extent to which the findings from a case study can be analytically generalized to other situations that were not part of the original study" (Yin, 2014, p.238). The empirical findings of this research are derived from three case studies. Although multiple case studies are used, their used 'Office as a Service' strategies were different. It could be argued that the empirical findings are therefore based on a very small sample size.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RECOMMENDATIONS

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8. RECOMMENDATIONS

This chapter presents the recommendations derived from the outcome of this research. The recommendations are based on the conclusions of the main and sub-research question, and the discussion. This chapter is split up into recommendations for (1) future research and (2) practice.

8.1. RECOMMENDATIONS FOR FUTURE RESEARCH

The recommendations for future research regarding the role of 'Office as a Service' within decision-making in the field of (Corporate) Real Estate Management are:

- *Enhance internal and external validity:* As concluded in sub-chapter 7.2.2., the empirical findings of this research are derived from three case studies. Although multiple case studies are used, their used 'Office as a Service' strategies were different. It could be argued that the empirical findings are therefore based on a very small sample size. It is recommended to further research the findings in order to enhance their internal and external validity. New future research based on new case studies to increase the sample size would make this possible.
- *Expand 'strategic decision approach' with a tactical level:* This graduation research has the objective to develop and present knowledge of how the physical resource can be enhanced by implementing 'Office as a Service'. Therefore, a Multi-Criteria Decision Analysis framework is created that takes into account the possible added values of real estate and occupiers' space demands (why) and combines this with the different 'Office as a Service' strategies (what). In the development of the preliminary design [§5.2. & 5.3.], the decision has been taken to first focus on the strategic level and leave out the tactical solutions: managed office, coworking office, serviced office. For future research, it is recommended to expand the model with this tactical level.
- *Pilot study:* As discussed in sub-chapter 7.2.3., with the developed 'strategic decision approach' a decision model is developed that shows the relationship between the different decision-criteria (demand) and the 'performance' of the alternative 'Office as a Service' strategies. However, this research has not yet tested and evaluated the operational usability of the model for the user. For future research, it is recommended to perform a pilot study that focusses on the development of operational usability.
- *Ratio Core-periphery vs 'Office as a Service':* As concluded in sub-chapter 6.5.2., a stepwise ascending relationship intervenes between the Core-Periphery model of Gibson and Lizieri (1999) and the alternative 'Office as a Service' strategies. In this graduation research this stepwise ascending relationship is only shown schematically. A recommendation for future research is to look into the chosen ratios in which the division is made between the core portfolio and periphery portfolio to optimize the operational part of the portfolio.
- *Optimal occupancy vs employees experience of workplace:* building upon the previous point of recommendation focussing on operational optimization, a recommendation for future research is to look into the optimal occupancy level of an office. A recent research by Leesman (2019) has not yet shown a direct correlation between the level of occupancy of workstations with the employees' experience of workplace. This could imply that well-designed workspaces do not have a negative effect from a high occupancy rate.

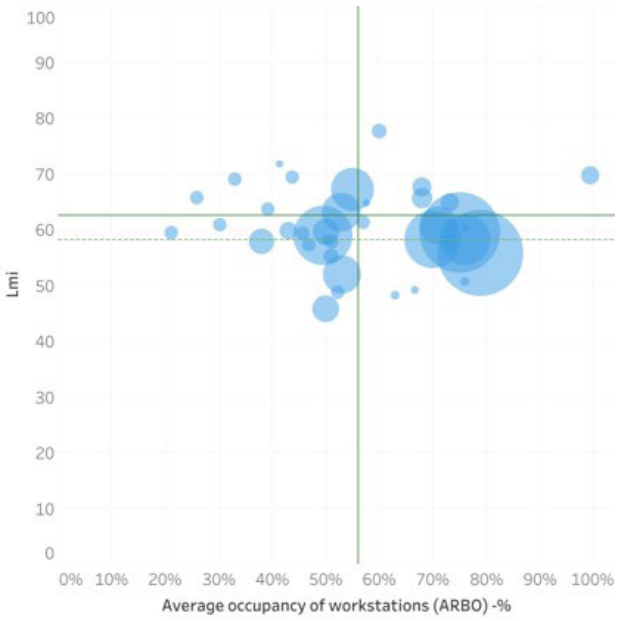

Figure 8.1.: *Occupancy level vs employees experience of workplace (Leesman, 2019)*

However, this research was the first time that data on occupancy level has been combined with the effectiveness of a workplace. A critical note can be made about the outcome of this research, as its conclusion was based on data between organisations with different office design, while measuring only the employees' experience of workplace on one occupancy level. It would be more comprehensive to research the effect on employees' experience of workplace for one organisation while measuring it at different occupancy levels. And afterwards compare the outcome between organisations. Therefore, additional research would be needed to enhance general applicability and validity of the outcome.

- *Ratio Core-periphery vs added value:* The previous two recommendations focus on the optimal use of square meters. Concerning the chosen ratios of the Core-Periphery model, it would be interesting to look into the ratios related to the other added values with the Core-Periphery model.

8.2. RECOMMENDATIONS FOR PRACTICE

The recommendations for practice regarding the role of 'Office as a Service' within decision-making in the field of (Corporate) Real Estate Management are:

- *Office operators decision-making model:* after making the choice for an 'Office as a Service' strategy, one of the next strategical choices can be the possible cooperation with of an office operator such as WeWork or Spaces. This cooperation can take place in multiple forms as has been concluded in sub-chapter 3.4.4.1.. The following question arises: how to select the most suitable office operator? Just as the hotel market, a diversification of brands of different office operators has taken place. And as concluded, one of the risks with such a form of cooperation is the extent to which the corporation's own identity might be compromised by the recognizability of the office operator. Therefore, it is recommended for future research into an office operators decision-making model that allows companies to make the best decision in comparing their own identity with the identity of the office operator. This can be done by making use of a NeedScope model which helps in analysing the different brands and identities. An example of such an analysis is given in figure 8.2. in which the different hotel brands are mapped.

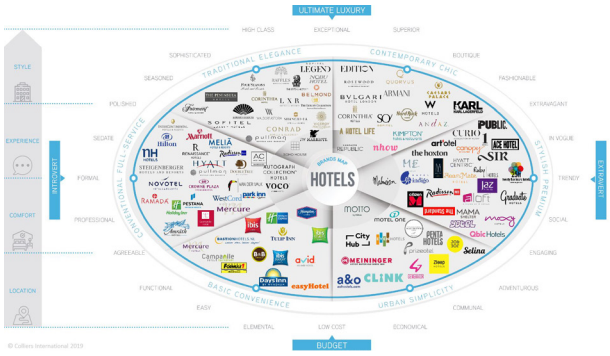

Figure 8.2.: Brandmap hotel market (Van Bree, 2019)

- *Financial decision-making model:* as concluded in sub-chapter 3.2., decision-making in the field of (Corporate) Real Estate Management requires multiple objectives that are often conflicting and they come from stakeholders driven by various goals. Drawn from the final design of the 'strategic decision approach', two of these objectives - including their matching strategies - are the inverse of each other: 'increasing flexibility with coworking (short-term)' and 'decreasing costs with traditional lease (long-term)'. The substantiation behind this contradiction is that the demand for flexibility and a short-term usage phase comes with a price. However, there is a breakeven point between the cost for flexible offices and the cost for traditional offices over time. Therefore, it is recommended for future research to look into a financial decision-making model that allows companies to make the best financial decision when comparing a standard traditional lease option with a flexible office. By doing so, flexibility can be made financially quantified.

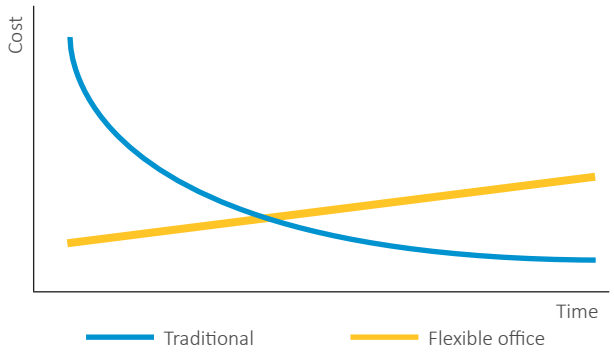

Figure 8.3.: Cost traditional vs flexible office space

REFLECTION

9

9. REFLECTION

The final chapter of this graduation research thesis, a reflection will be provided on the graduation research and process. The reflection comprises a reflection on the research relevance, research methods and research process.

9.1. RESEARCH RELEVANCE

This section will discuss the position of the research within the graduation laboratory and the corresponding chair of Real Estate Management and it will describe the scientific and societal relevance of the research.

9.1.1. POSITION OF RESEARCH WITHIN GRADUATION LABORATORY

The graduation laboratory Smart Real Estate Management builds on various researches that have been conducted upon (Corporate) Real Estate Management (CREM). In these studies, the challenge is how to match the changing needs of users, the dynamics in an organization's strategy and the unforeseen growth or shrinkage with a static portfolio of buildings. As alignment of an organization's real estate to its corporate strategy / user needs is a long-standing problem.

This graduation research examined how 'Office as a Service' can be a strategic decision approach for organization's to optimize their physical resources in order to obtain maximum added value. Hereby, the research contributes knowledge about the alignment of an organization's real estate to its corporate strategy / user needs by offering a strategic decision approach in 'Office as a Service'.

9.1.2. SCIENTIFIC RELEVANCE

Although a high number of academic studies is available on the three main bodies of knowledges Real Estate Management, Decision Support Systems and 'Office as a Service', current academic research does not discuss the relationship / combination between them. The graduation research created empirical knowledge regarding a strategic decision approach of 'Office as a Service' within (Corporate) Real Estate Management, which created more scientific knowledge on a strategic level regarding this subject.

Secondly, within §1.8.2. five points are mentioned in which this graduation research may contribute to the aims and objectives of the department Real Estate Management of the apartment of Management in the Built Environment, within the faculty of Architecture and the Built Environment at the Delft University of Technology. Looking back at these five aims / objectives the following conclusions can be drawn concerning this research:

- It focusses on the probable, possible and desirable real estate intervention of Office as a Service to create the best possible match between supply and demand.
- It shows a way how Office as a Service can add value to organisations, individuals and society as a whole.
- It shows a way how Office as a Service can cope with vacancy and the dynamics in the demand for real estate.
- It provides empirical evidence on how Office as a Service as an accommodation strategy adds value by corporate real estate.
- It provides a tool to support multi-actor decision-making in the design of an accommodation strategy.

9.1.3. SOCIETAL RELEVANCE

As mentioned in the first chapter of this research (§1.8.1.): The societal relevance of this graduation research can be found in the citation of Hans de Jonge: "Accommodate the future demand in existing stock." (Arkesteijn et al., 2016.). With this intention, I started this research to see how the implementation of 'Office as a Service' within the underutilization of office space could optimize the mismatch between supply and demand. In this research related to the strategy 'open house'. With this optimization of the existing stock a reduced demand for newly-build supply could be realised. However, during literature research I realized that this optimization between demand and supply could be realised through a variety of solutions, each with its strengths and weaknesses. As a result, I broadened my scope and focussed on multiple 'Office as a Service' strategies with the aim to compare them according to the presumed added values and occupier space demands. This means that an optimization can still be achieved which results in a better utilization of supply. But the starting point to realize this optimization moved from an 'supply driven' perspective to a 'demand driven' perspective.

9.1.4. SECTOR RELEVANCE

As mentioned in the first chapter of this research (§1.8.3.): The sector relevance of this graduation research will be related to the four performance criteria defined by De Vries (2007) and Den Heijer (2011): Competitive advantage, profitability, productivity and sustainability. As market research (JLL, 2018; Harrison, 2018) showed that the market of flexible office space has doubled since 2014 and a further future growth is expected, the need for organizations to develop a clear strategy to add value is getting more important. With the development of the 'strategic decision approach' the alternative 'Office as a Service' strategies are related and compared according to the four performance criteria defined by De Vries and Den Heijer. This allows organizations to develop a clear 'Office as a Service' accommodation strategy that aligns their real estate to their core business in order to obtain maximum added value for the business and that contributes optimally to the overall performance of their organization.

9.2. RESEARCH METHOD

In the following sections, the different research methods that have been applied to conduct this research will be discussed. The methods used in this graduation research are: literature review, interviews and a case study research.

9.2.1. LITERATURE STUDY

The literature study lays down the basis of the empirical part of the research and is therefore the primary source of information in this graduation research. The literature study of this research focused the three bodies of knowledge: Real Estate Management, Decision Support Systems and 'Office as a Service'. With the aim to merge this together in a decision model that shows the relationship between the performance of real estate (demand), translated into possible added values, with 'Office as a Service' (supply).

Regarding Real Estate Management this resulted relatively simple in the input based on the model of Den Heijer (2011) to assess the added value of real estate decisions regarding the four stakeholder perspectives with their corresponding presumed added values.

Regarding 'Office as a Service' this was already a bit more difficult as scientific literature about 'Office as a Service' mainly focussed on the concept of flexible serviced offices instead of the possible alternatives in terms of supply. Therefore, various sources were used that focussed on market research. However, this brought the following difficulty as mentioned in sub-chapter 3.4.3.: the diversity of the flexible office solutions varies with its multiple labels and has led to an element of inconsistency over what a serviced office comprises.

With regard to the last topic, Decision Support Systems, there was sufficient literature. However, it took me a lot of effort to choose the right one out of the available models.

9.2.2. MODEL DEVELOPMENT

Based on the established specifications that emerged from the literature study, the first conceptual design of the 'strategic decision approach' was developed. At the start of the research my objective was to have an actual working decision model that could be operationally tested later on in the research. However, as the research progressed I realised that more time was needed to achieve this. First, more focus time had to be spent collecting data on the relationship between the decision-criteria and the alternative 'Office as a Service' strategies. As a result, it has not yet been possible to meet the objective to have an actual working decision model.

9.2.3. SEMI-STRUCTURED INTERVIEWS

Several interviews were conducted to verify, supplement and refine the first conceptual design of the 'strategic approach', which was based on a literature study. An explorative, open-ended, semi-structured interview approach was chosen to provide guidance during the interviews and to obtain similar structured data from each interview.

In addition to checking the presence of the correct decision-making criteria and alternative 'Office as a Service' strategies, this mainly focussed on the relationship between them. Although the choice for a semi-structured interview method with a supporting interview protocol, due to the social nature of this qualitative research method, the interviewees have their own interpretation of the presumed added values and alternative 'Office as a Service' strategies. This can influence the outcome on the obtained data and the translation to the decision model.

9.2.4. CASE STUDIES

Case studies were used in this research to create empirical knowledge. A comparative case study approach was chosen to link this research to practice as this research is designed to solve real-life problems. The results of the case study process supported the development of the detailed design of the 'strategic decision approach'.

As mentioned in §9.2.2., at the start of the research my objective was to have an actual working decision model that could be operationally tested. My aim was to test the model through a case study research in which the outcome of the developed decision model according to the future supply could be compared with the chosen accommodation strategy of the organization. However, as the research progressed I realised that this aim was not feasible in the given timeframe. This changed the role of the case study. Instead of evaluating the operationality of the model, the case studies were used to collect more data related to the relationship between the decision-criteria and the alternative 'Office as a Service' strategies.

9.3. RESEARCH PROCESS

This last sub-chapter reflects on the research process that has been gone through in the past 2,5 years from a personal point of view. During the past 2,5 years two synchronous processes can be distinguished that had an effect on each other: the process of the development of the strategic decision approach and the process of personal development. Both processes will therefore be included.

September 2017 – November 2017

September 2017 started the process of graduation. The first choice to make was the choice of subject and/or graduation laboratory. This one was quickly made due to my interest in Real Estate Management and my personal aim to come to the conclusion if I wanted to continue my professional life in Real Estate Development or in Real Estate Management. Since I already had a background in Real Estate Development, the choice was easily made. Subsequently, the next question followed: "what do I really want to investigate within the subject?". This proved to be a long search, which looked into combining both subject of development and management. But after discussions with my mentors and reading articles related to 'coworking' and 'Office as a Service' the choice was made to focus on this topic from an end-user perspective. This resulted in a research question that focuses on the development of a decision model about the implementation of 'Office as a Service' within the accommodation strategy of an organization.

December 2017 – July 2018

This period can be described as probably the most difficult time during my graduation process. After deciding what the perspective and topic was of my research, the process to further develop the research proposal got stuck. With reading a variety of literature, I did not get the acquired knowledge and thoughts structured. Resulting in a first P2 moment where there was no basis to continue the research. The consequence was that a new P2 moment was scheduled before the summer holiday. Even though I understood it in a rational way, mentally it was quite an intense moment that had its effect on the subsequent months. In the meantime, supported by my mentors, an attempt was made to structure the story line and improve the research proposal which at the second P2 moment did improved but still lacked a strong basis.

August 2018 – February 2019
After the second P2 presentation, together with my graduation committee it was decided to use the remaining time till graduation for a process of personal development. The relatively safe environment of a university provided this opportunity. The period from August 2018 to February 2019 was used to tackle the feeling of 'perfectionism and a fear of failure'. I look back on this afterwards as a period of 'pain relief'. This period gave also a new opportunity: a graduation internship at Colliers International. A new environment which provided me with new motivation and a structured daily schedule to continue working on my graduation.

This resulted in a P2 2.0 or P3 light presentation in which finally the research proposal and literature study came together in a clear story, translated into the conceptual design of the strategic decision approach. The first positive results of an intensive six months became visible.

March 2019 – September 2019
However, after this period in which an upward trend had started, the process came to a halt again. Despite the previous period in which a process of personal development was started, the feelings around 'the fear of failure' came back. Hereupon I made the decision to go back to the psychologist again. A new process started but this time more focused on the cause of the problem instead of fighting the problem. The results resulting from this process provided insight into the process of graduation until then and in the years prior to graduation and even university.

Related to the strategic decision approach, the development process from a conceptual design into a preliminary design took a while as result of which the relationship with the case studies also was delayed. With the P4 presentation at the end of September, this was something which was still missing and needed to be finished.

October 2019 – December 2019
With passing the P4 presentation, the insights out of the process of personal development, being offered a job and the opportunity to graduate before the Christmas holidays, all the puzzle pieces fell into place. A situation that felt unreal to me as after such a long and intensive period my time at the university would come to an end.

But as mentioned by Nelson Mandela: "the greatest glory in living lies not in never falling, but in rising every time we fall". This graduation process can be described as a process with a lot of falling, but with this moment of graduating also a time to rise again. With the final months, the development of the strategic decision approach will come to an end for now, the time for further personal development will just begin.

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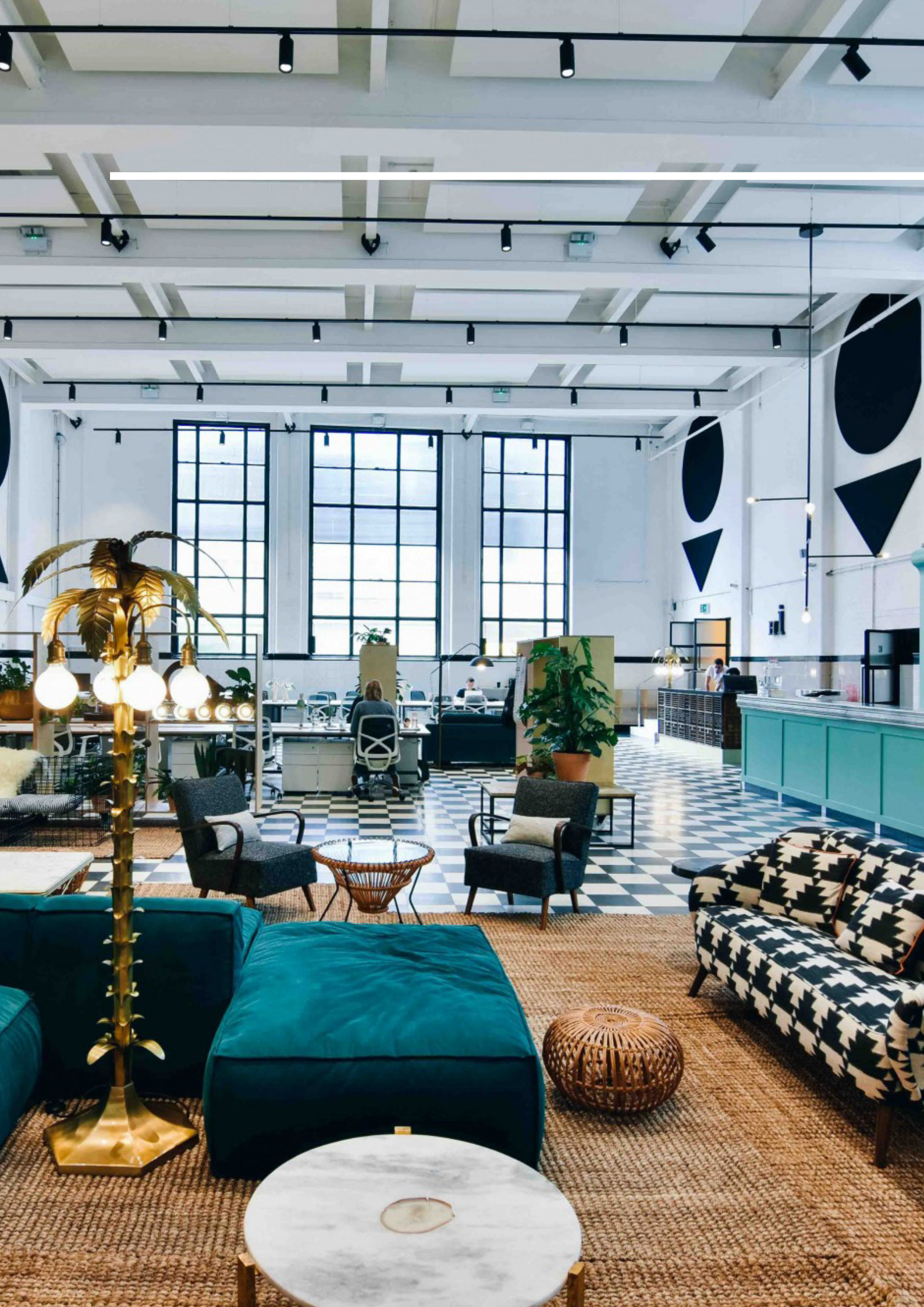


APPENDICES

A. LIST OF INTERVIEWEES

The two lists of the interviewees that took part in this research are presented in this appendix. The first table is related to step 5 (§2.2.3) of the research design in which the conceptual design is verrified. The second table is related to step 8 (§2.2.5) in which the case studies took place. In this table the organisation of the interviewees belonged to is discribed as well as their position and the relation to the research.

SELECTION OF INTERVIEWEES

Stakeholders that are related to the topic of ''Office as a Service'' can be placed in a triangle related to demand-supply. On the one hand the occupier who represents the demand side, on the other the market who represents the supply side, and at last the consultant who is the connection between demand and supply. For the research design both sides are taken into account. For the selection of interviewees both the consultants and the market parties are selected to verify, supplement and refine the conceptual design of the 'strategic decision approach', after which a case study round takes place with the occupier (demand side).

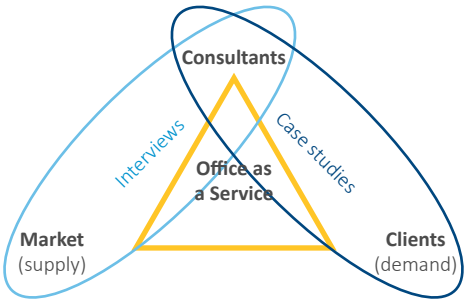


Figure A.1.: *Selection of interviewees*

Company	Date	Name	Position
Colliers	24-05-2019	Marjon van Bree	Corporate Real Estate Solutions consultant
		Lennard de Wit	Corporate Real Estate Solutions consultant
CBRE	09-07-2019	Remco Kroeze	Global Workplace Solutions consultant
Cushman	16-07-2019	Asaël Akkerman	Global Occupier Services consultant

Table A.1.: *List of interviewees preliminary design*

Company	Date	Name	Position
ING	20-5-2019	Nikolaas Waaning	Global head of Corporate Real Estate Strategy
Microsoft		René van der Vlugt	Digital transformation lead
Uber		Paul van Wijngaarde,	Global Workplace Program Manager

Table A.2.: *List of interviewees detailed design*

B. INTERVIEW PROTOCOL PRELIMINARY DESIGN

The used interview protocol for step 5 (§2.2.3) of the research design will be introduced in this appendix. This protocol is part of the research methodology as presented in chapter 2: methodology.

Interview protocol

Locatie:
Datum:
Bedrijf:
Geïnterviewde:

Een strategische nadering van Vastgoed as a Service
Voor mijn afstudeeronderzoek van de master 'Management in the Built Environment' aan de Technische Universiteit Delft, doe ik onderzoek naar het ontwikkelen van een strategische nadering van 'Vastgoed as a Service' om daarmee de kloof tussen vraag en aanbod te helpen verkleinen. Mijn afstudeeronderzoek probeert daarmee antwoord te geven op de volgende hoofd onderzoeksvraag:

Hoe kan 'Vastgoed as a Service' een strategische benadering zijn voor een organisatie om hun vastgoed te optimaliseren om een maximale toegevoegde waarde te bereiken?

Achtergrond van het onderzoek
Organisaties hebben vastgoed nodig om hen in staat te stellen hun activiteiten effectief en efficient uit te voeren in een veilige, beschermde en plezierige omgeving. De afstemming van hun vastgoedstrategie op de organisatie strategie / gebruikersbehoeften is echter al een lang bestaand probleem. De relatie tussen een gebouw (aanbod) en zijn gebruikers (vraag) verandert voortdurend. Omdat de vraag naar aanbod voortdurend verandert, is er meestal een discrepantie tussen wat een gebouw kan bieden en wat een organisatie vereist. Daarom is een van de grootste uitdagingen in Corporate Real Estate Management het verkleinen van de kloof tussen de dynamische vraag van het bedrijfsleven naar vastgoed en het relatief statische aanbod van vastgoed. Dit onderzoek bekijkt hoe een strategische benadering van 'Vastgoed as a Service' deze kloof kan helpen te verkleinen.

Onderzoeksmethode
Het onderzoek wordt uitgevoerd aan de hand van interviews and case studies. De interviews en case studies worden gehouden om inizcht te krijgen in het strategische beslisproces voor de implementatie van een Vastgoed as a Service strategie. De case studies die behandeld worden zijn ING, Microsoft en Uber. Deze projecten hebben allen een vorm van Vastgoed as a Service geïmplementeerd. Door ze met elkaar te vergelijken kan waardevolle informatie opleveren in de ontwikkeling van een strategisch beslismodel.

De resultaten van het interview zijn alleen voor kennisdoeleinden bestemd en uw antwoorden zijn anoniem. Het interview bestaat uit een aantal vooraf opgestelde vragen, maar er is ook ruimte voor aanvullende vragen die kunnen volgen uit uw antwoorden.

Als uw zelf vragen heeft, kunt u die natuurlijk altiijd stellen.

(De vragen zijn opgesteld als richtlijn voor het interview, de volgorde staat niet vast en er is ruimte voor andere vragen die volgen uit de antwoorden van de geïnterviewde)

01 Introductie

- □ Uitleg waar het onderzoek over gaat.
- □ Wilt u anoniem blijven?
- □ Aangeven onderbreken voor vragen of verduidelijking
- □ Toestemming voor het maken van audio-opnames.

02 Why

Added values

- □ Welke added values worden naar uw inzicht beantwoord door een Office as a Service strategie?
- □ Welke Key Performance Indicators hebben naar uw inzicht hier invloed op?

03 What

Office as a Service strategies

- □ Kloppen naar uw inzicht uw inzien de meegenomen verschillende strategies?

04 Relationship why - what

Added values

- □ Hoe verhouden de verschillende Office as a Service strategiën zich ten opzichte van elkaar op basis van de added values?

Occupier space demand

- □ Hoe verhouden de verschillende Office as a Service strategies zich ten opzichte van de verschillende types van Occupier space demands?

05 Afsluiting

- □ Heeft u nog tips, op of aanmerking?
- □ Mag ik u bij eventuele openstaande vragen nogmaals contact opnemen?

Dit is het einde van het interview. Bedankt voor uw medewerking. Ik verwacht mijn onderzoek in december af te ronden, daarna stuur ik de resultaten naar u op.

C. CASESTUDY PROTOCOL

The used case study protocol will be introduced in this appendix. This protocol is part of the research methodology as presented in chapter 2: methodology.

SAMPLING

In this research three cases will be analysed during step 7 of the research design. Some authors say that often one case study is enough to generalize findings. For example, Flyvbjerg (2006) tries to argue that single-cases studies can be used to generalize findings. But when he comes to his conclusion he admits that "formal generalization is overvalued as a source of scientific development, whereas 'the force of example' is underestimated" (Flyvbjerg, 2006, p. 228).

Since in the real estate sector, every project is unique and strongly influenced by its context, conducting a single-case study is questionable. Moreover, since the concept of 'Office as a Service' is new, there are no representative cases available. That is why a multiple case-study approach is appropriate and used in the graduation research.

This research involves a qualitative research design. This means that an information-oriented selection is most appropriate (Yin, 2014). The objective of conducting case studies is to collect relevant empirical data. In order to gain this data, a criterion sampling approach is used, whereby cases are selected that meet certain criteria (Bryman, 2012, p. 419).
Following Bryman (2012) case selection in qualitative research exists of two levels, selecting the context and selecting the participants. Selecting the cases will be done by means of purposive sampling. Purposive sampling is a strategic way of selecting (Bryman, 2012, p.410). In line with the conceptual model and organizational perspective, the following selection criteria are used:

- The organisation is a private organisation that has an user/supplier perspective.
- The organisation has undergone a strategic decision process about the implementation of 'Office as a Service'.
- The four 'Office as a Service' strategies are present

Based on these selection criteria the following three case studies were selected and presented in table X.

Criteria	ING	Microsoft	Uber
Private organisation	x	x	x
Strategicc decision process	x	x	x
Office as a Service strategies			
Traditional	x	x	x
Open house	x	x	
Colocated		x	x
Coworking	x	x	

Table C.1.: *Case study selection*

DATA COLLECTION

Yin (2014) defines six sources of evidence in case studies: documentation, archival records, interviews, direct observations and participant observations. The next sources of evidence, as described by Yin (2014), will be used while conducting case study research:

- Semi-structured interviews
- Documentation

Organisation	Name	Position
ING	Nikolaas Waaning	Global head of Corporate Real Estate Strategy
Microsoft	René van der Vlugt	Digital transformation lead
Uber	Paul van Wijngaarde	Global Workplace Program Manager

Table C.2.: *List of interviewees case studies*

DATA ANALYSIS

The case studies will be analysed using a so-called cross-sectional case study design (Bryman, 2012; Yin, 2014). While analysing the case studies, the derived information will be linked to the preliminary design of the 'strategic decision approach'. The different case studies will be seen as individual research studies. The analytical design consists of two types of analyses: in-case analysiss per case study and 'overall' cross-case analysis covering all three case studies.

IN-CASE ANALYSIS

The in-case analyses has been made first. The aim of this analyses is gaining empirical data form the case studies. Hereby the focus lays on the intended added values and occupier space demands (why) and the chosen 'Office as a Service' strategy (what) and the relationship between them (why-what.

The three selected case studies are discussed separately in this chapter. Each case study description starts with an overall introduction of the project, which provides background information about the project context and the implementation of an 'Office as a Service' strategy. This is followed by the presentation of the in-case analysis of each case study. The information obtained from the in-case analysis will be presented in three steps:

- Step 1: *why* – what are the intended objectives/added values;
- Step 2: *what* – what are the chosen strategies;
- Step 3: *why-what* – how are they related to each other;

CROSS-CASE ANALYSIS

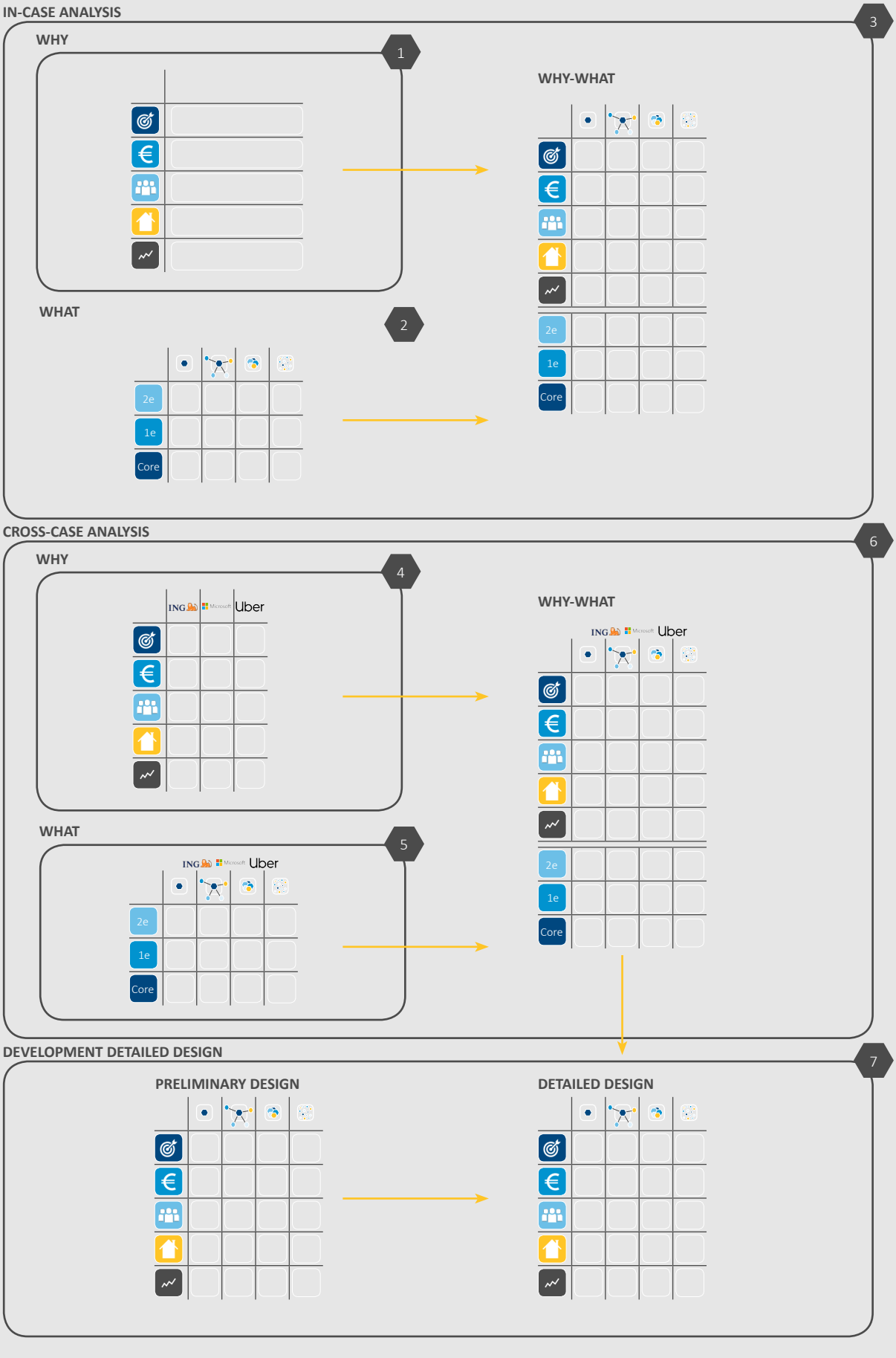
A cross-case analysis was made after the in-case analysis. The cross-case analysis aims to identify similarities and differences between the case studies. To do this, a pattern matching technique is used (Eisenhardt, 1989; Yin, 2014). In this cross-case analysis the same three steps are used as within the individual analyses.

- Step 4: *why* – compare the intended objectives/added values;
- Step 5: *what* – compare the chosen strategies;
- Step 6: *why-what* – compare the relations;

DEVELOPMENT DETAILED DESIGN

The outcomes out of the cross-case analysis are then compared with the preliminary design of the strategic decision approach in order to come to a detailed design:

- Step 7: integrate data of the cross-case analysis with the preliminary design of the strategic approach;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3
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Uber
WHY-WHAT
WHAT
5
DEVELOPMENT DETAILED DESIGN
7
PRELIMINARY DESIGN
DETAILED DESIGN

D. INTERVIEW PROTOCOL DETAILED DESIGN

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01 Introductie

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- ☐ Wilt u anoniem blijven?
- ☐ Aangeven onderbreken voor vragen of verduidelijking
- ☐ Toestemming voor het maken van audio-opnames.

02 Why

Added values

- ☐ Wat waren de beoogde doelstellingen voorafgaand aan de implementatie van een 'Office as a Service strategie?

Occupier space demand

- ☐ Wat waren de verwachte typolgieën van 'occupier space demand' voorafgaand aan de implementatie van een 'Office as a Service strategie?

03 What

Office as a Service strategies

- ☐ Op welke manier heeft u geprobeerd die doelstellingen te beantwoorden?

04 Relationship why - what

- ☐ Hoe verhouden de verschillende Office as a Service strategiën zich ten opzichte van elkaar op basis van de added values?
- ☐ Hoe verhouden de verschillende 'Office as a Service' strategieën zich ten opzichte van het Core-Periphery model?

05 Afsluiting

- ☐ Heeft u nog tips, op of aanmerking?
- ☐ Mag ik u bij eventuele openstaande vragen nogmaals contact opnemen?

Dit is het einde van het interview. Bedankt voor uw medewerking. Ik verwacht mijn onderzoek in december af te ronden, daarna stuur ik de resultaten naar u op.

E. REAL ESTATE MANAGEMENT

The following appendix presents an overview of existing models in Real Estate Management that are related to this graduation research.

E.1. LEVELS OF MANAGEMENT

According to Joroff et al. (1993), three levels of management can be identified: strategic, tactical and operational. These levels are widely used by practitioners as an operational model for real estate, creating a distinct separation of the tasks and activities amongst the three levels.

In terms of the real estate portfolio, the strategic level corresponds to portfolio management; the tactical level to asset management; and the operational level to facility management (Van Driel & Van Zuilen, 2016). An organization deploys steering mechanisms for each of the management levels, where the strategic layers sets frameworks and guidelines for the underlying layers and the tactical layer forms a junction, where strategy is translated into choices and plan of execution which the operational layer executes.

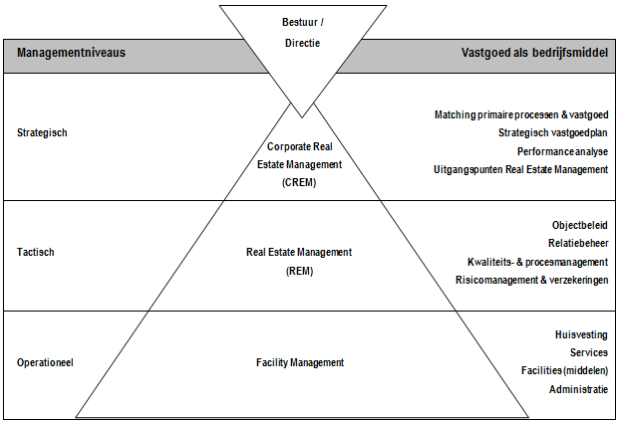

Figure E.1.: *Management triangle (Driel & Zuilen, 2016)*

E.2. THE CORE-PERIPHERY OPERATIONAL PORTFOLIO

Applying the core/non-core concept to the corporate real estate portfolio, Gibson and Lizieri (1999) developed the core-periphery operational real estate portfolio space model as shown in figure X. This model drew upon human resources conceptual frameworks and analysed the corporate real estate portfolio in the same terms. Three main categories of corporate real estate were identified:

- The core portfolio is space that the organisation needs over the long term. Therefore, long leases or freeholds would be acceptable provided that the terms permitted alterations and that the space was configured to enable physical change.
- The 1st periphery portfolio consists of space held on medium-term leases (typical duration of three to ten years). This space was required where the long-term future of activities accommodated was uncertain.
- The 2nd periphery portfolio is the "space on demand" portfolio where speed of occupancy and unencumbered vacation are important. This is the space that has traditionally been supplied by the serviced office sector.

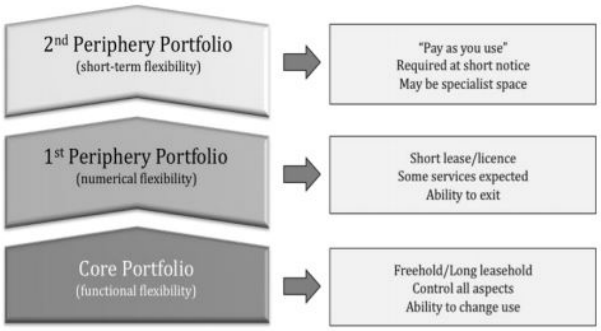

Figure E.2.: *The Core-Periphery operational portfolio (Virginia A. Gibson & Lizieri, 1999)*

F. DECISION SUPPORT SYSTEMS

The following appendix presents an overview of existing models in Decision Support Systems that are related to this graduation research.

F.1. THE DAS-FRAME

De Jonge et al.'s (2009) rectangular model is presented as "designing an accommodation strategy". Four vertices are defined by two pairs of dimensions – current/future and demand/supply. Between the four vertices are four matching or decision points (consisting of eight or nine tasks (added in Den Heijer (2011)):

- 1. Determine current match (between current demand and supply)
- 2. Determine future match (between future demand and current supply)
- 3. Weigh and select alternatives (to create future real estate supply for the organization)
- 4. Create the step-by-step plan (transition from current to future supply)

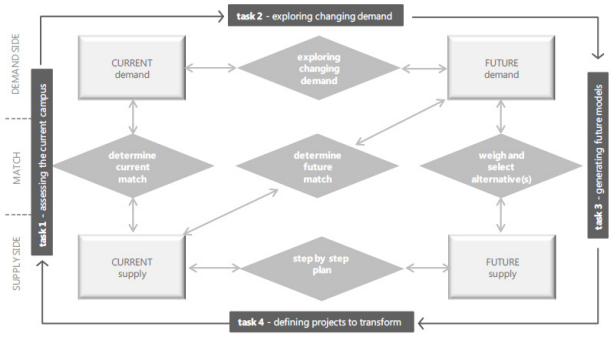

Figure E.1.: *The DAS-frame (De Jonge et al., 2009)*

Multiple triggers for changing the accommodation strategy are identified. Because the model is a "design" process, iterations are expected before the "final" match (strategy). Later, development does include double-headed arrows between the model's elements that were not in the original's version (Den Heijer, 2011).

G. OFFICE AS A SERVICE

The following appendix presents an overview of existing models in Office as a Service that are related to this graduation research.

G.1. SERVICES AND FACILITIES

Van de kar et al. (2017) created an overview of services and facilities that can be find within serviced offices. This overview is based on a list that is composed by Weijs-Perrée et al. (2016), services and facilities that are mentioned by Peltier (2001) and Gibson & Lizieri (2000) together with services and facilities that were found online on websites of serviced office operators. This resulted in a list of 31 services and facilities, which includes among others building related services and facilities; food and drinks related services and facilities; non-work related services and facilities; an all sorts of spaces and areas.

Gibson & Lizieri (2000)	Peltier (2001)	Weijs-Perréé et al. (2016)	Van de Kar (2016)
FM services (cleaining, security)		Cleaning and maintenance	Cleaning and maintenance
		Security	Security
IT / telephone lines	LAN connections, internet	Managed technology services	
		Use of coffee and tea maker	Coffee / tea machine
Secretarial serivces, word processing	Secretarial services	Secretarial services	Secretarial services
		Networking events	Networking facilities
Catering		Catering	Catering
Fully fitted space	Furniture	Furniture	
		Workshops and lectures	Workshop and lectures
		Business services	
	Translation / interpretation	Consultancy services	Consultancy services
		Other services (fitness, bicycles, dry cleaning, clothing repair)	Other services (fitness, bicycles, dry cleaning, clothing repair
Reception		Reception / entrance	Reception services
Meeting rooms		Conference room	Conference room small & large
		Office space with fixed workplaces	
		Office space with fixed / shared workplaces	Office space with fixed / shared workplaces
		Office space with fixed and shared workplaces	
		Kitchen	Pantry
Social facilities		Informal / social meeting space	Social meeting space
		Storage room	Storage room / lockers
		Coffee corner	
	Training room	Project, creative- or classroom	
Photocopying	Colour copies	Space for copy, print, mail etc.	
		Atelier space	Atelier space
		Business hall / unit	
		Concentration / study room	Concentration room
		Showroom	
		Laboratory space	
Video conferencing	Video conferencing		
Telephone message	Voicemail		
Parking			
Telephone answering	Local phone services		
	Travel / concierge services		
			Multiple locations
			Extensive opening hours (24/7)
			Own postal adress
			Advanced climate control
			Electric car / bike charging
			Gym / fitness
			Childcare
			Entertainment
			Smoking area
			Outdoor area

Table G.1.: *Overview of services and facilities find in literature*


TUDelft


Colliers
INTERNATIONAL