Reflection

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1.1 Reflection on product, process and planning

From demand to supply

From the start, I wanted to do something with the changing environment we find ourselves in. The world is constantly changing, and many of the available management tools do not take into account this change. Therefore, I started in the graduation laboratory "structural changes in the use patterns of offices", as this focusses on this change. At P1, my focus was on how a framework that matches demand and supply can deal with changes in the demand. The topic originally started with identifying the future demand. As the research continued, and I read more and more on the topic of matching supply with demand, it became clear that a focus on demand was much more related to business management rather than to real estate management. A focus on changes in the supply side however, does have a direct relationship with real estate management, and is equally important as well. Therefore, the topic of this research has changed at the start from changes in the demand side to changes in the supply side.

The theoretical foundation

First, a literature study was conducted, as to give insights in the state of art development on both corporate real estate management and risk management. As the focus was on identifying the changes in the supply side of real estate, a tool to "look into the future" was required as to identify what the future supply characteristics of a location could be, and therefore to identify what the change between now and a future moment in time is. For this, risk management and time series analysis provided the solution, as it provides a framework for first identifying what the future values of a characteristic could be, and secondly for making a decision based on this information. Even though I had some experience with quantitative forecasting from my minor Finance, I found out that precisely discerning the process of forecasting in general and time series analysis in specific was difficult without a solid basis on this topic. Therefore, during the P2 phase, it was difficult for me to accurately describe my plan of approach and basis for this research. Despite this, I was glad I had done this, as in my opinion, linking to research fields is a very interesting thing, combining knowledge to create a new tool.

In the literature study itself, I partly succeeded in keeping a structured approach towards tracking the literature I had read. Always immediately saving the papers I read and putting them in a reference programme helped me in finding back literature more easily. However, I could have improved this by adding search tags to each paper or by maintaining a literature grid, which would make finding things easier. If this process could be done again, I would have done this more precise.

The pilot company

After the theoretical foundation was laid down, it was time to find a pilot company, in which my developed framework could be tested. This process proved to be the strikingly difficult. The search for a pilot company caused some serious delay in the process, as a lot of companies, even though they were interested, indicated that they did not have time to take on this process. As the testing of such model required much more time from the company than for example a round of interviews, a company should really invest in the project, which most were reluctant to do.

Moreover, in my contact with the first companies, I explained the model on a much too theoretical level, and was quickly drawn into the details of how the model works. In this, I learned the valuable lesson never to make something you want to "sell" too difficult to understand. A much stronger focus on what the end result of the process would be, and

what the added values for the company are, made it easier for companies to see why they should invest time in the process. Thankfully, Engie Services had a case that suited the framework very well and was happy to have me conducting my research on their behalf.

Developing the model

Adapting the Preference-based Accommodation Strategy design approach to suit my needs for risk analysis was mainly the goal of this research. Defining the exact changes to the procedure proved to be quite difficult, as one has to be very precise in writing down what should be done. Also, in following the process, I often found that providing a solution to one problem, caused a new problem. Adapting the procedure required some extensive designing and redesigning.

Next to the procedure, the mathematical model needed adaptations as well. As my programming knowledge was very limited, it was difficult for me to start on making a new mathematical model. Initially, I wanted to create the model in Python, as my experience was mostly in this language. However, the invaluable support from Rein de Graaf was only possible if I switched to Matlab. In this programming language, a previous model was already written by Rein and Hylke de Visser. Using some parts of this structure, the first phase of the modelling process mainly consisted of understanding how the structure was build and adapting it to the specific case on Engie. The next step was to add the risk analysis in the model, by adding scenarios to the process. This required some extensive remodelling of the Matlab model. Often, these changes surpassed my programming knowledge, and without the help of Rein it would be impossible to complete the model in time.

Testing the model

During the pilot study, the entire model was tested on a real-life case. The iterative process worked really well from a research perspective, as the model could be adjusted every time again. The stakeholders that were involved were not all familiar with real estate processes and real estate decisions. This made it important to always explain things from a perspective that was understandable for everyone. This process helped me in rethinking my research over and over again, simplifying the explanation without going into much detail. The stakeholders also indicated that this eventually helped them to understand better what the research was about.

In the evaluation interviews, it became clear that despite the added complexity of the model, the stakeholders were able to understand everything the model did. Moreover, the stakeholders accepted the outcomes of the model as being the result of their input and their preferences. The incorporation of risk in the model and a future time perspective was considered as an added value by the stakeholders, as the decision-making process became more strategic.

Overall, the first pilot study with this new framework can be considered successful, and provides a solid basis for further development of both the framework itself and the mathematical model. In my personal opinion, the framework is indeed effective in incorporating risks in a preference-based location decision-making process.

1.2 Research reflection

Research objective and utilisation potential

The aim of my research was to develop a framework, which incorporates risk in a preference-based location decision making process. This came forward from the problem that location decisions are often made for a long time period, but location characteristics change over time. The result of this research is a framework for location decisions, that is preference-based and takes into account risk. In this sense, the research objective is met, although some critical notes are always in place. Firstly, more research is required as to test whether the Location Decision-Making (LDM) framework does indeed comply with the objective in other case studies. Moreover, it is difficult to know exactly if all risks are taken

into account in the model. In a comparison with the original Preference-based Accommodation Strategy design approach however, it was found that the incorporation of risks does result in a different portfolio alternative to be selected, although the best alternative selected by PAS came a close second. The stakeholders however indicated that the incorporation of risks is an added value, as the discussion between the stakeholders is raised to a more strategic level.

In terms of the utilisation potential, my perception is two-sided. On the one hand, the model requires some heavy adaptation for each case and the mathematical model is difficult to use without prerequisite knowledge on Matlab programming and the process of the mathematical model. This significantly hampers the utilisation potential. On the other hand however, the framework does lead to the desired end result and provides a basis for a thorough and detailed analysis of what the stakeholders want. Furthermore, at JLL it was indicated that they really see potential in application of the model, if the difficulties mentioned in this paragraph can be solved. My personal ambition is to further develop the framework to a more practical programme, in which the mathematical model is easier accessible and parts of the programming are automated. For example, a predefined set of decision variables which are already written in the programme can significantly speed up the process, only requiring adaptations for personalised decision variables. The goal of this development is the incorporation of the LDM framework as one of the basic tools for the JLL strategic consulting department.

Scientific relevance
This research finds itself at the intersection between two research fields. The scientific field of corporate real estate management aims at facilitating the business in their operations through real estate. The scientific field of forecasting and risk management is introduced in this research, as to find a practical approach to a longer period of match between the supply and business demands. The research also builds on the continuous improvement of matching supply with demand in real estate. Starting with the Preference-based design procedure of Binnekamp, through the Preference-based Accommodation Strategy design approach, this is the third large adaptation of the framework. Future research should distinguish the added value of the LDM framework.

Achievement of ambitions
Next to adding to the scientific body of knowledge, and to graduate, this graduation process also allowed me to achieve some ambitions I had set for myself at the beginning of this thesis.

The first goal was to create more in-depth knowledge on both decision-making processes and future analysis methods. In my opinion, both these goals were achieved. My understanding of time series models has significantly increased during this research, and both the internship experience and the literature studies helped me in exploring the relationship between demand and decision more thoroughly.

The second goal of this research was to have follow a graduation internship, as to gain practical experience in the field I was researching. This ambition was actually achieved twice over, by having a graduation internship at both JLL and Engie Services. This combination, although time-consuming and sometimes difficult to plan, helped me in viewing problems from multiple sides. On the one hand, from a JLL perspective, I could build on vast knowledge of corporate real estate decision making processes, and get involved in some interesting projects that were beyond the scope of this research. On the other hand, the internship at Engie services helped me to get more in-depth knowledge of the company that was part of the pilot study and gave me the opportunity to follow every step of the LDM framework in detail.

A third goal was to finish the thesis in the time that was assigned for the research. Unfortunately, this I failed to achieve this ambition. The cause for this is twofold. First, starting a graduation internship that also involved working dedicated on JLL projects

caused a delay in my progress, as I had less time to focus on the study. I noticed after a while that the focus was too much on working for JLL rather than on my thesis, due to my own excitement and interest of 'the real thing'. Nevertheless, I would sincerely recommend everyone to follow a graduation internship, for the experience you get and the network you build are priceless. The second delay of this research was caused by the difficulty of finding a company for testing the model. Part of this lies in my initial inability to describe my research in an understandable manner, without overloading the recipient with details. Just focussing on the end goal and a general overview of the process helped in finding the company quicker. Next time, I would try to get to the essence of the research earlier, and only present this to interested companies. Moreover, following-up more on potential leads could help as well.

The last ambition was to make something that is usable in practice. In my opinion, academic research is invaluable, and always extremely important to the overall development of mankind. However, if no link exists between academic research and practice or real life, research fails to serve this purpose. Therefore, it was my goal to do an operational research, that resulted in an artefact that could actually be used in practice. I succeeded in this in the sense that there is an artefact (the LDM framework), that is usable in practice. However, the framework does need some heavy redevelopment before actual use in practice.