



PERSONAL REFLECTION

Master thesis – J. Oudot – May 2019 – Management in the Built Environment – TU Delft

Topic selection

The reason to research smart buildings from an investors perspective was that, in this way, I would be able to research two topics I personally like within real estate. The stories I heard about The Edge really interested me, while my interest in the investors perspective was raised during multiple courses during the Management in the Built Environment Master. By researching the value of smart offices for investors I was able to dive deeper into smart offices while keeping in touch with the investment world. Another reason to choose the investors perspective was to align the research with my Graduation company, PingProperties. I wanted to research a topic that would also be interesting for PingProperties which simply resulted in research the value of smart offices.

Reflection on Aim

My initial idea was to create a model in Excel that could calculate the return on investment for smart technology. The idea was 'simple': If an investor invests X amount of money to make a building smart, he will earn his investment back in Y years and increase the value of the asset by Z. During my first presentation, the P1, I even presented a mock-up of the model that was made for the 'Operations' course. The idea was to compare cash flows of traditional office with the cash flows of smart office and base the model on the differences.

However very quickly I realised that it was simply not possible. First of all, no company just gives away the cash flows of their offices. Secondly, the implementation of smart technology are not really quantifiable and the actual costs are not publicly available. Due to the unavailability of cash flows and data on investment costs the whole idea to quantify smart technology had to be changed after my P2 presentation.

While reading through more literature the Value Map of Jensen & Van der Voordt (2017) helped to change the aim and align it better with the possibilities. The idea was to create a similar value map that connected smart technology with investor objectives by using added values. In the end, this value map was actually achievable given the available information and therefore resulted in the end product being a Smart Value map.

Looking back, the objective remained the same but the ambitions were toned down throughout the process due the lack of available (and accessible) information. The aim shifted from a quantitative to a qualitative model.

Both the interviewees from the Edge Olympic and The Outlook stated that the results were not yet concrete due to the building being just delivered. I think that with time, the Value Map can be quantified piece by piece and in the future transformed to a map that is more convincing for investors since the quantified value will be more apparent

While the toning down of ambitions was sometimes a bit demoralising it did challenge the way I had to structure the research and the process.

Reflection on methods

Literature review

The first stages of the literature review were fairly frustrating. The aim was to quantify the investment value of smart technology. However, no information was publicly available on any of the necessary topics. The information remained superficial and 'vague' and did not at all dive into the quantified costs and benefits of smart technology.

After the aim was adjusted to the possibilities, the literature review was more straightforward. By using added values as a 'gateway' to connect investors and smart technology the main focus of the literature review was researching the added values, of which there is more than enough literature available.

The harder part of the literature review was finding adequate information on smart buildings and smart technology. The majority of the sources are market reports composed by large companies such as KPMG and Deloitte. These kind of sources often lack the academic 'stamp' and are less unbiased. These sources also lacked depth, as the actual smart applications found in office were described nowhere in these sources.

Case studies & Interviews

The case studies ended up relying more on the interviews than I had expected and the interviews ended up going differently than expected. The Outlook interviews were done at the same time that I was doing the document review for the case. This resulted in me being less aware of information gaps. The Edge Olympic interviews were conducted after the document review which allowed me to check any information I already had and ask specific questions to enrich the case. Timeline wise it would have been better to first do all the document review possible and then do the interviews to check the information and enrich the cases.

Furthermore, each interview would derail and not follow the interview protocols. The four topics that needed to be researched per case were however discussed but not in the way as described in the interview protocol. Steering the conversation was harder than expected and the enthusiasm of the interviewees made it hard to cut them off and align them with the interview protocol. I think in the end, if you strictly follow the protocol, the conversation flow is disturbed and the interview becomes less natural and enjoyable.

It is a shame that I did not end up interviewing the investors of The Edge. I did contact them but ended up interviewing the Facilities Manager of the Edge. Of course his input was invaluable but since the research was focussed on the investors it is a shame that no answers were gathered from them. This was increased after the interview with the investors of the Edge Olympic, who went quite deep into the performance of their smart portfolio and how it resulted in higher rent levels and improved tenant retention and attraction.

The biggest struggle with the interviews was to set the actual dates for the interviews. Finding interviewees was easier than expected but setting the dates took longer due to busy schedules. Some of the interviews had to be done through phone and one interviewee had to be done by mail. However, this was also due to me underestimating the time it takes to set up interviews. If this process would have started earlier, it would have been less impactful. So a recommendation for myself is to start this process earlier.

Expert panel

The expert panel started out as a Delphi-panel, with the aim to reach certain consensus level on the added values and the applications. The respondents were supposed to rank the added values and the smart applications on a scale from 1 to 8 or 9 with each 'rank' being only held by one value or application. However, due to some mistakes on my side the participants were able to rank the values and applications equally. Meaning that some participants scored multiple values and applications equally. This resulted in a scoring rather than a ranking as not all respondents had a clear first place or last place but rather multiple, shared, places. In the end the decision was made to name the method an expert panel, as the lack of ranking made it hard to complete as a Delphi-panel. Using the geometric mean the results could still be ranked and some conclusion could be made.

Another 'fail' in the expert panel method was the lack of second responses and more importantly the lack of difference in responses. The participants were given the option to adapt their scoring based on the group average. However, out of all the participants, only one (1) participant changed the scoring of the added values. The scoring of the smart applications remained completely unchanged.

Time wise the expert panel was also problematic, the method was defined later on in the research which made the process less detailed. This led to the rounds being conducted very late in the research process. Simultaneously, I underestimated the amount of responses and the time it took for the respondents to answer.

Looking back

The research approach set up before the P2, differed from the research execution. This becomes quite clear when comparing the protocols for the interviews and case studies with the actual structures. While fairly similar, the P2 case study protocol was structured in a way that compared the input from users, managers and investors. In the end the case studies were structure in an input, output and outcome way. This was due to the gathered information not being dividable in the user, manager and investor perspectives. Also to align it better with the value map, the input, output and outcome way was preferable.

Reflection on conclusions and findings

The end-product, while very different from what I wanted it to be in the beginning, still supports my initial aim. Due to the lack of quantifiable information in the Smart Value Map the end-product is less convincing than I had hoped it would have been. While the map does connect the smart technology to the core objectives of an investor it still lacks the **actual** impact needed to convince the traditional investors. While it is theoretically substantiated that, for example, enabling climate systems to adapt automatically based on the actual use of the building can save costs, the questions remains: Yes, but how much does it save? And how much does it cost?

The same can be said for 'Satisfaction'. The findings pointed out that 'Satisfaction' is very important. Tenant satisfaction as well as employee satisfaction. The findings also pointed out that many of the smart applications increase satisfaction. The question still remains: To what extent does it increase satisfaction?

Hopefully these questions will be answered in the (near) future, maybe even by using my Value Map to select the smart applications that increase satisfaction or decrease cost.

Other findings

I found it very surprising that most of the smart offices were realised due the tenant demanding them. I initially targeted the investors since I thought that they would be the ones taking the initiative. However, it seems that large corporate tenants like Microsoft and Deloitte are very effective triggers for the development of smart buildings. Many investors would be all too happy to develop a smart office if it meant signing a lease contract with a tenant like that. So in the end, maybe convincing large corporate tenants might be a better approach to increase adoption rates of smart offices. On the flip side, OVG Real Estate proves that an investors is also more than capable at driving innovation in real estate.

In the end, I hope my Smart Value Map will be able to at least convince someone of the benefits of smart offices, or be used as a reference for future research