'Speech is the most disturbing noise in the workplace and decreases satisfaction' (Hongisto, 2005; refers to Kaarlela-Tuomaala et. al., 2004).
Reflection & Discussion

Focus of this graduation research
This thesis research focused on the increasing awareness of the unconscious influence of the building environment on human behaviour, and explored how organisations could use this to add value to their business. Since this research relatively started from scratch, it started with a thorough literature research to create a state of the art of this domain itself: in what ways does the increasing trend of influencing human behaviour by interior design relate to a company’s productivity? Next to that, this research focused on the consequences of this trend on the corporate real estate management domain. How can the corporate real estate manager benefit from this trend? This question is being answered by the setup of a database that demonstrates the first sights of a status quo on how to unconsciously influence behaviour by interior design aspects. This database has been put to test in practice by a workshop interview, that lead to a positive evaluation of the potential of this database.

Scientific and social relevance
On beforehand, this graduation research had the ambition to acquire knowledge that contributes to the corporate real estate domain of the academic world. During the literature study, a gap of knowledge was found. It concluded that there is a large effect of the built environment on human behaviour and their state of mind, and that this influences the productivity of an organisation (Voordt 2003, Barrett and Barrett 2010). Other researches also concluded that more research on influencing behaviour by interior design should be done, but in other domains. ‘What determines a pleasant environment for consumers and how this affects buyer behaviour are exciting regions for continued exploration’ (Sherman and Mathur 1997). The literature research also concluded that research on interior design showed that due to the increase of multisensory environments, the influence of unconscious stimuli by interior design aspects on human behaviour is rapidly growing stronger (Barrett and Barrett 2010). It was clear that there were interesting study results available, but all these studies researched a very specific interior design aspect influencing a very specific type of human behaviour or activity. In other words: there was no state of the art composed yet on how interior design (unconsciously) influences human behaviour and activities.

This graduation research had the ambition to build this state of the art on how to influence behaviour by interior design aspects. This has been done by an extensive literature review. Over 375 studies on interior design aspects influencing human behaviour and activities have been collected in a database. By not only collecting the results, but by categorizing them into usable variables, each variable shows an average of research results. These have been summarized and explained in the P4 report. To not only let the database remain a blur of data, there has been programmed a search function in it. This search function makes it possible to easily filter the database on information per variable. By doing this, this state of the art not only remains an interesting theoretical framework, but it also demonstrates the potential to be a valuable toolbox in practice as well. During an interactive ‘post-it workshop’ interview setting, the database was tested with a designer and the financial director of a supermarket. Their conclusion was that, from a retail perspective, the database could especially be beneficial when filtered on ‘frustration’, ‘stress’ or ‘complaints’ variables.

This research has been performed within the corporate real estate management domain. Since this research addresses the influences on user activity of corporate real estate, it is focused on the role of
the corporate real estate manager. As there is stated that there is an increase of multisensory environments, and the influence of unconscious stimuli by interior design aspects on human behaviour is rapidly growing stronger (Barrett and Barrett 2010), impact on the role of the corporate real estate manager should be expected. The evolution of the role of the corporate real estate manager has been analysed throughout literature, but the latest phase dates from around the year 2000. The current view therefore on how the corporate real estate manager should adapt to the stated trends therefore is not yet described in literature. This graduation research proposed an updated accommodation strategy and activity / interior analysis, which enables the corporate real estate managers to add value to their organisation by benefitting the potential of the increasing influences of interior design on human behaviour.

**Reflection of results**

This graduation research was set up to be a first fundament on how corporate real estate management is affected by the emerging trend of increasing influences by interior design aspects on human behaviour. The ‘recommendations’ part of this thesis reflected on the results of this graduation research and found some missing links, for which more studies are needed to create a fully comprehensible state of the art of this topic. These missing links are visualized as recommendations in figure 88, and will also be briefly discussed here.

First of all, this graduation research is focused on the consequences of the increasing influences of interior design aspects on user behaviour, directly impacting the domain of the corporate real estate manager. There could be, however, other emerging social trends that influence user behaviour within buildings. How other types of trends compare to the trend in this graduation research is unknown. It would be an interesting study to see what the current trends are that seem to influence activity patterns of humans within the built environment.

Second, the relationship model designed during this graduation research (figure 26) illustrates that there are several other factors able to influence user behaviour, besides interior design aspects. These factors consist of personal factors, social factors and job factors (like salary, challenges, progress, etc.). It seems impossible to quantify how these factors compare to each other at influencing human behaviour, but a comparative qualitative study between for instance two factors could be very interesting for further research.

**Performed in this research**

1. Trend observed and analysed with direct impact on the corporate real estate management domain.
2. Visualised influence of observed trend on organisational (corporate) level.
3. Proposed updated corporate real estate manager role to anticipate on consequences.
4. Designed state of the art and usable toolbox with manual to create value for the organisation.

**Recommendations for further research**

1. Are there other trends influencing user activity within buildings, and how do they compare to this one?
2. What influences do the other (personal, social and job) factors have on user activity?
3. Are there other trends influencing the CRE manager role, and how do they compare to this one?
4. How do the unknown interior design variables influence user behaviour? Is the status quo the status quo?

Figure 88 – This graduation research and recommendations for further research (own illustration)
Besides social trends influencing how users behave within the built environment, there might also be trends that impact directly the role of the corporate real estate manager. Since the role of the corporate real estate manager is connected to many other stakeholders, there could be a wide variety of trends influencing them, potentially impacting the role of the corporate real estate manager. This graduation research analysed these evolution stages, and projected an updated one based on the trends that lead to this graduation study. But not only a study focused on trends, but even a whole more in-depth analysis of the evolution of the role of the corporate real estate manager could lead to interesting insights. It would be an interesting study to see what these other current trends are that seem important for the role of the corporate real estate manager, since the latest role of this manager according to theory dates from around 2000 (Ali, McGreal et al. 2008).

Fourth question of reflection on the research results is: is the created status quo really the status quo? The answer to this is: yes and no. This research started from scratch, and lead to a relationship model on how organisations are influenced by the stated trend, an proposed update of the role of the corporate real estate manager to anticipate on the stated trend, and a database of 375 research results describing how interior design aspects influence user activity. As a whole, the results form a clear start of a fundament that describes these new developments within the corporate real estate management domain. But it could also be argued that it is not complete at all. The database for instance; by categorizing the literature research results into specified key variables, a hotmap (figure 49) has been designed which illustrates the content of the database: what interior design aspects have been found to influence what type of user behaviour? The hotmap displays a lot of green cells, which implies that there is still a great lot of studies that could be performed on certain interior design aspects influencing specific types of user behaviour. So it could be concluded that this is a start of a state of the art, hungry for further research.

The validity of the research data is also important, considering that over 375 research results have been used in this graduation research. How does one validate research data? Golafshani used Joppe’s (2000) explanation of validity. According to him, validity ‘determines whether the research truly measures that which it was intended to measure or how truthful the research results are’ (Golafshani 2003). By stating the source of each research result in the database, and thereby adding the type of research and how many participants took place, it has been attempted to create a clear first impression for the user on how reliable the research result is.

Discussion
The process of this graduation research has been a dynamic, exciting one with ups and downs. The novel character of this research topic made it a challenging one to begin with. The first period till P2 was an exploring ride on how to frame the research questions to best guide this research process. This remained challenging up till the P4 presentation. Since the research basically started from scratch, it was known and discussed from the beginning that literature research would probably be the main research method in order to create a state of the art of this domain, and how it influences the corporate real estate domain. It was a personal urge however that I was not able to suppress, to involve an insight from practice in this research. After the P2 presentation, I was hoping to become an intern in one of the Dutch large supermarket organisations. I hoped that, by their lead, I would learn a lot on the psychology of supermarkets, and how they use interior design to influence their customers. I was hoping to find their own ‘secret theories’ on how to stimulate consumer behaviour. This process took some time and in the end did not succeed. When looking back to this, I think I’m glad that it did not
work out that way, because I learned that supermarket organisations are, just like many scientists, not completely sure on how the process of influencing customers works because of the lack of evidence. The rise of neuroscientific research is basically the first and only way to acquire hard evidence on how human behaviour is influenced.

There were also times that I looked back to the things I did so far and wondered what it was I really added as ‘new knowledge’ to this academic world. At the beginning of this research I had really liked to observe people’s behaviour by tweaking interior aspects in a certain case study setting. But when I read more and more articles on researchers that tried this, it became clear that this would have probably added less knowledge to the academic world than the work I did now. These type of studies require a great amount of time to study one particular effect on one type of human behaviour or activity, so I’m glad that for this graduation study I invested the time to create an overall image of the whole domain.

I certainly do not see my database as the end result of a state of the art of this domain. It shows merely the first pillars that needs more researches to become a complete fully state of the art. It however shows potential to become a very interesting and valuable tool when updated in future, especially since neuromarketing researches are being performed more and more now. Because I really do see value in an updated state of the art like this database, I am now exploring on how to get this database online, open for any updates by any scientist that is interested in it. I think researching like this suits the time were living in, where online communities like this are growing and people are interested in sharing knowledge online together. I hope that, when the P5 presentation will be there, this database will be online and open for any scientist to update it.

Considering the corporate real estate management domain, I think that a shift of focus on user activity within corporate real estate is needed to cope with these trends. An activity / interior analysis helps setting the right goals, could save costs by using interior the right way and is operational for many types of decisions. The proposed new ‘role’ of the corporate real estate manager is probably not a whole new proposed role on itself, since the current role of business strategist is already based on a concept that adapts to external trends. The updated version however does include this activity / interior analysis and argues for the user activity focus that could in many occasions help adding that bit of extra value to the organisation’s business.