Master Degree Project in Management

Translating Boundaries

A study of Activity-Based Working at AstraZeneca

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Abstract

Boundaries are often taken as a given in the literature and little is known about the construction process of boundaries. To address this gap in previous research, a case study was undertaken to observe movement of boundaries. In this paper, the authors observed the implementation of Activity-Based Working (ABW) at AstraZeneca (AZ) in Gothenburg. By looking at the employees' behavior in the new office solution and by adopting a translation perspective when analyzing the empirical data, this paper contributes new insights regarding boundary construction and different boundaries interdependency. Since research about the ABW-office solution is scarce, a secondary contribution of this paper offers new insights regarding the ABW-concept. Drawing on the case study, the authors found that the relation between psychological and physical boundaries are closely interlinked. Furthermore, the psychological boundaries seem to have a larger impact on physical boundaries than previous studies emphasize. Drawing on the findings, the authors use an illustration to visualize the aspect of time in the process of boundary construction of physical, mental and social boundaries.

Keywords

Activity-Based Working, Boundaries, Space, Translation, Translation model.

Introduction

Organizational change processes are about creating or moving boundaries (Hernes, 2004a; Hernes & Paulsen, 2003), although little research and practice have taken them explicitly into consideration, therefore boundaries might need even more attention today. Today's society is shaped by globalization and new technologies, which creates new understandings of the workplace, which establishes new boundaries (Williamson, 1987; Garsten, 2008; Hernes & Paulsen, 2003; Hernes, 2004b; Dale & Burrell, 2008). New ideas of the workplace can for example be the possibility to work from home, whilst commuting and/or at cafés. As a result, it is possible to discuss organizations and its workplace in terms of space, as working no longer simply is executed at the organization's physical buildings (Hernes, 2004b; Dale & Burrell, 2008). The new boundaries also affect the mindset of the people in the organization, which is why the importance of psychological boundaries increases (Hirschhorn & Gilmore, 1992). A result of the increasing flexibility in work arrangements is that boundaries becomes more blurred (Garsten, 2003).

Boundaries as a phenomenon have received increased attention in research (Hernes & Paulsen, 2003; Huzzard et al., 2010). The new set of boundaries creates a new organizational identity and it can take time for employees to adjust due to the fact that they still identify with the old way of working (Paulsen, 2003). Establishments of new relationships and networks are both important and necessary when changing the workplace because it can contribute to diversity of experience and reflective learning in the working team (Huzzard et al., 2010). The dynamic of spatial configurations is about creating, moving and strengthening boundaries. Space cannot exist without boundaries because without boundaries space cannot be distinguished from other spaces (Hernes, 2004b). This indicates that sometimes when researchers discuss issues in terms of space they also discuss in terms of boundaries without mentioning it. This relation between boundaries and space is how we will make use of the literature on space, thus when discussing space we bear in mind that this space is formed by boundaries.

Continuous developments in the business world is the way organizations design the workplace; hence the way organizations reconstruct boundaries in the physical and psychological space. In the beginning of the twenty-first century, researchers acknowledged a trend that companies designed the workplace in order to make it more collaborative (Barber et al., 2005). The changes are said to be a result of the company's need of being cost effective as well as maximizing the use of their resources (Barber et al, 2005; Appel-Meulenbroek et al., 2015). There are always new trends in the way of working, which often challenges social norms regarding the workplace (Schreifer, 2005), and one trend is the Activity-Based Working (ABW). In an ABW-office solution, the employees do not have their own personal desk or room, instead, the office area is divided into different zones that are suitable for different work tasks. The employees choose which zone they want to work in depending on which type of work task they will perform. The facilities in each zone are designed to support different work modes, for example, silent zones, rooms that are intended for meetings and phone calls, open space areas and collaboration areas. The main goal when implementing an ABW-solution is to promote collaboration and exchange of knowledge between the employees (Wyllie et al., 2012). An additional goal is to reduce square meters and costs (Veldhoen Company, 2016). ABW creates an environment that increases the employees' responsibility and creativity (Wyllie et al., 2012). However, ABW is not a 'one-size-fit-all' solution (Wyllie et al., 2012), the implementation therefore needs to be adapted to the context at hand.

The purpose of this paper is to study the continuous reconstruction of different types of boundaries during a reorganization of the workplace. We do this by using the notion of translation as developed in Actor-Network Theory (ANT), to understand and explain the social processes that construct boundaries and the interdependency of different boundaries. The concept of translation has been used in various ways to study social processes. We chose to use translation in order to incorporate different employees' perceptions of new ideas or objects (Latour, 1986), to understand how social processes develop. In order to achieve our purpose, this paper draws on an empirical case study at AstraZeneca (AZ), a biopharmaceutical company that implemented an ABW-office solution. This case allowed us to investigate how boundaries were constructed and altered as there were friction between intended use and practical use of the ABW-solution, due to different understandings of new formal boundaries.

In this paper, a theoretical framework is presented which provides the reader with an understanding of boundaries and spatial configurations, as well as translation processes.

Thereafter, a description of how the study was conducted and how the data was analyzed will be presented. This is followed by a presentation of the setting, describing the preparing process and implementation of the ABW-office solution at AZ, and the different working areas it contains. Thereafter, the results and analysis are presented regarding three different ABW-areas. This is followed by a discussion, where boundary construction and interdependency between different sorts of boundaries are highlighted. Lastly, conclusions, managerial implications and suggestions for future research will be presented.

Boundaries and Spatial Configurations at the Workplace
Researchers have identified different ways of categorizing boundaries. Hirschhorn and Gilmore (1992) distinguish four different types of boundaries, which all regard psychological boundaries; political boundaries, task boundaries, authority boundaries and identity boundaries. Van Maanen and Schein (1979) identify three different types of boundaries; functional, inclusionary and hierarchal. Additionally, Santos and Eisenhardt (2005) divide organizational boundaries into four perspectives; efficiency, power, competence and identity. All of these distinctions concern only the psychological boundaries, which is why we will make use of Hernes (2004a; 2004b) distinction of boundaries due to the fact that his framework regards both physical and psychological boundaries. Hernes (2004a; 2004b) divides boundaries into three categories: physical, mental and social boundaries. Physical boundaries are tangible, as for example formal rules, electronic devices and physical barriers. Mental boundaries are those that are created by thoughts, knowledge and sense making, which establish a social coherence. Social space and boundaries are created through bonding, for example, through trust, love and loyalty, which is also connected to identity formation and norms of behavior (Hernes, 2004a; 2004b). Hernes (2004b) argues that these three categories of boundaries shape the organization. For example, physical space could play a key role during reorganizations with an aim of improving the efficiency. At the same time, leaders can use social space during reorganizations in order to change power relations, and mental boundaries can be identified through arguments and negotiations during change processes. Hernes (2004b) develops the discussion concerning space and further argues that physical space can have an impact on both mental and social space. He exemplifies this by stating that physical space can create repetitive behavior, which in turn creates perceptions and knowledge of expected behavior and this fosters social bonds.

Space, especially the physical environment, can be used as a control mechanism by organizations because the office layout can communicate hierarchical levels as well as communicate how to behave in certain environments (Baldry, 1997; 1999). In addition to such arguments, buildings can be seen as artifacts; people act in accordance to the building and the building is at the same time constructed by the people (Gieryn, 2002; Dale & Burrell, 2008). The interior design of the workplace can therefore communicate how the workers should behave, for example, cubicles can indicate that management encourages individual work (Hope, 2015). This indicates that the physical space can have an impact on the mental space and the social space and this impact is highly underestimated (Baldry, 1997; Hope, 2015). Further, the physical space can contribute to stability and stable relations between groupings if the arrangements of the workplace is not questioned or changed (Hope, 2015; Halford, 2004; Gieryn, 2002), thus if the boundaries are not renegotiated. Van Marrewijk (2015) studied an implementation of a flexible work concept, where he concluded that employees had a strong relation to the specific floor that

they were operating at and as a result they perceived their floor as a boundary. Halford (2004) studied an implementation of hot-desking, which means that all desks were non-personalized. She found that the workers occupied the same desk, which they regarded as their own and did therefore not clear it at the end of the day, in order to book it for the next day. She concluded that the change in the physical space had an impact on the employees; some felt stressed since the office layout required tactical planning of the workday (Halford, 2004). The trend of open offices that are intended to increase the efficiency might in fact also have an impact on the relations between the employees and affect the employee's identity because they often relate to the spatial layout (Dale & Burrell, 2010).

Personal space has historically had a high value to individuals, which is why individuals personalize their office because they want to be in control of their territory (Baldry, 1997). Social relations are dependent on the spatial configurations at the workplace, which indicates that space has a high value to employees (Halford, 2004). People have different preferences on where to sit in an office; some prefer to sit with friends and team members while others want to sit at a distance from the managers; such desires are highly connected to space and the spatial conditions at the workplace (Halford, 2004). However, social bonds can also constrain actions taken by individuals since social boundaries create behavioral norms and communicates what is expected by the members of the social group (Hernes, 2003).

Hernes (2003; 2004a) argues that traditionally in management and organizational studies, there is a perception that boundaries are stable over time, however, Hernes (2003; 2004a) and Marshall (2003) argue that this is not the case since change is about restructuring boundaries. Taking a normative approach, Hirschhorn and Gilmore (1992) argue that managers should put stronger emphasis on managing boundaries and should do it in accordance to the employees' perception of the boundaries. It is therefore important for managers to regard boundaries as created in the everyday life through different actions (Kerosuo, 2003). Boundaries are therefore not only something that managers can outline, as they are also manifested through interactions and can thus be reinforced, defended or questioned by the people in the organization (Kerosuo, 2003; Rafaeli & Vilnai-Yavetz, 2003). Boundaries are therefore not something that can be studied as an existing thing as they are constantly re-drawn through interactions, changes in the environment and are affected by past experiences (Hernes, 2004a). Management can create certain physical boundaries through for example building walls; however, since boundaries also arise through social interactions, it indicates that management cannot control all organizational boundaries (Hernes, 2003). If an organization changes the spatial design at the workplace, there is a risk that the change process is affected, since members of the social group are not prepared to let go of already established social boundaries (van Marrewijk, 2015; Hernes, 2003). To solve such issues, some organizations try to introduce new attractive identities connected to the spatial layout, in order to have successful outcomes on the organizational changes (Hernes, 2003). It is therefore important that management is aware of social boundaries when undergoing a reorganization since new boundaries will be established (Paulsen, 2003). New boundaries will also create new identities, which in turn will affect the employees since they will renegotiate and create new ways to feel as a part of the organization (Paulsen, 2003), hence create a sense of belonging (Hernes, 2003).

Boundaries are often taken as a given and therefore considered as existing things, while little is known about the actual process of boundary construction and reconstruction. By

studying a reorganization of a workplace there is a great opportunity to study boundaries, as they become more visual during change processes. Furthermore, researchers often discuss boundaries and space as separate phenomena, instead of as a combined phenomenon. By adopting the perspective of translation, we try to trace and explain the process of how boundaries develop continuously.

Processes of translation

Translation is one of the central notions in ANT, which is an approach for studying social relations in action, i.e. ongoing/in the making activities, rather than ready-made entities (Latour, 1987). In order to analytically discuss the interdependencies between physical, mental and social boundaries, and how boundaries are constructed, we use the concept of translation as described by Bruno Latour (1986).

With regard to how new ideas spread, Latour (1986) distinguishes the translation model from the more traditional diffusion model. According to the diffusion model, an idea (or; fashion, gadgets, goods, claims, artifacts, etc.) would spread in a one-size-fit-all manner, without changing and would only slow down the pace if met with resistance of some kind. Hence, the idea is transmitted from one time and space to another, without any adaptations to it. In contrast, in the translation model, an idea (or; fashion, gadgets, goods, claims, artifacts, etc.) will go through a translation process as it spreads. Everybody and/or everything that come in contact with the idea will act in different ways, putting their touch to it, hence shape it in accordance to their different projects. People might drop it, add to it, appropriate it, modify it, deflect it or betray it (Latour, 1986), hence there are several ways an idea could change in translation. This translation process will continue, and as long as someone takes it up, it will keep on spreading. For an idea to be translated into action, it needs to be supplied by an image of action. By for example materializing an idea in text, the idea will be easier to act upon, and an idea that is repeatedly translated into action will be stabilized and taken for granted (Czarniawska & Joerges, 1996).

Latour (1986) further explains the importance of material objects, in order to strengthen a definition of something to make it hold over time. He explains the unstable structure of primates' society, where social elements alone are the bonds that hold things together. By making use of material objects, as humans do, the definition of an idea (or; fashion, gadgets, goods, claims, artifacts, etc.) will be clearer and the understanding better. He exemplifies by stating that the power of a manager may be obtained by several resources, such as telephone-calls, clothes and walls, which make up a long arrange of elements. Those elements help others to deepen their understanding regarding what the power of a manager is. It is therefore important to materialize ideas to suit the context at hand in order to keep them spreading.

According to Czarniawska (2002), mimesis is a way of explaining why translation occurs and how ideas are spread and embedded in a new context. Mimesis is about seeing, or hearing about, actions to then imitate that behaviour. It is not copying, since the mimic behavior will be a translated version of the observed behavior (Lindberg, 2002). Some ideas are more detailed than others, with for example rules and guidelines, hence they do not leave much room for reinterpretation (Sahlin-Andersson, 1996). How the idea is translated in the new setting is not always open and creative, but might be affected by conformism, social control and

traditionalism. The idea is translated by combining the old ways of working with the new idea (Sahlin-Andersson, 1996).

Many researchers, who have used the perspective of translation, have shown how ideas travel through time and space and from one place to another over a large geographical area or within an organizational field (see for example; Callon, 1986; Lindberg & Erlingsdóttir, 2005; Nicolini, 2010). We will apply the same perspective within a local setting, hence making use of the same concept yet in a smaller scale. Regardless of the scale, the complexity is still apparent and to be able to grasp what is happening in a process of translation, it is necessary to gain extraordinary insight and access to the object of study. Therefore, a study of ethnographic character was conducted and we got close to the action by being present at the site. The design of the study, how we collected the data, and how we analyzed the same are presented below.

Design of the Study

This study aims to create a greater understanding of how different types of boundaries, which are interdependent, are constructed through translation processes. A qualitative research was conducted in order to gain this deeper understanding, which is in accordance with Silverman's (2013) recommendations. Furthermore, Flyvbjerg (2006) argues that a case study provides the researchers with a deeper understanding of the subject since they are being part of the phenomenon and can therefore create a nuanced view on what is going on. When we conducted this study, it was important to consider different members' subjective experience and notions in order to successfully trace the process of translation as boundaries are constructed (Watson, 2011). Thanks to the extensive access that we received at AZ, we were able to gain deep knowledge by shadowing, observing, participating during meetings, and interviewing the members of the organization, which is in line with an ethnographic case study approach (Czarniawska, 2012; Silverman, 2013). A limitation with this extensive access could be argued to be the risk of becoming indoctrinated, and therefore lose the critical approach towards the ongoing social process. However, we argue that the complexity of the social process makes it hard to fully understand what is going on when you are simultaneously involved in the process as this can only be understood retrospectively by taking a step back and analyzing what has been observed from a distance.

Data Collection

A pre-study was conducted in December 2015, where we held three pilot interviews, received documents and observed the setting for the first time. The pre-study was useful in order to acknowledge and define an idea for a purpose of our study (Silverman, 2013). The main data collection was conducted later on, with a start in the beginning of February 2016. We were present at the AZ Gothenburg site for six consecutive weeks, constantly observing the employees and the environment. During those weeks we conducted 24 interviews, dedicated 11 workdays for pure observations, participated in and observed six meetings regarding the ABW-office solution, and we gathered relevant documents.

Interviews	Counts	Observations	Counts
Managers	8	Present at site	6 weeks
Employees	13	Present at meetings	6 meetings
Project group	6	Focused on observations	11 days
Total	27		

The table above summarizes the amount of conducted interviews and observations.

The interviews involved employees from all levels since their position in the company might have an impact on their experience of the ABW-solution and the adhering rules. The sample was chosen through an information-oriented selection, which contributed to maximizing the information from a rather small sample that qualitative studies often generates (Flyvbjerg, 2006). By recording and transcribing all interviews stepwise and by taking time to reflect, it was possible to acknowledge new interviewees, which we contacted personally through AZ's internal email system. This procedure also allowed us to develop new questions in order to gain a deeper knowledge of how boundaries are constructed. The interviews were conducted in a semi-structured manner and open-ended questions were used, consequently the employees answered the questions more freely and descriptive which provided us with a deeper knowledge of the subject (Silverman, 2013). It is important to bear in mind that interviews as a setting can create power relations between the interviewee and the researchers; hence it might have an impact on the result. We therefore tried to make the respondents feel comfortable during the interviews by starting with questions about their role at AZ. Kvale (2006) argues that if the respondent feels comfortable it increases the quality of the data collection. Moreover, there is always a risk that the respondent answers what he or she believe the researchers want to hear (Czarniawska, 2014; Silverman, 2013; Nederhof, 1985), to counteract such a risk complementary observations were conducted.

Observations were used in order to understand what the respondents were discussing during interviews (Eisenhardt, 1989), as well as to identify and observe boundaries in the respondents' everyday work life (Silverman, 2013). Observations made it possible to gain new insights, since some things are difficult to describe during interviews (Watson, 2011). Shadowing of employees, participation in meetings and observing the everyday work life at AZ contributed to the study as it covers different angles of the organizational work (Silverman, 2013). During our observations we focused on how employees used the different areas by, for example, looking at how they used the meeting rooms and for how long they reserved desks or meeting rooms. We also observed differences in sound levels and if there was a tendency that the employees occupied desks within the same area. We took time to write notes during our observations and we complemented those notes the upcoming day. To our advantage we were able to both observe separately and jointly, in order to cover a larger area and to register more data.

In order for the observations to be successful, it was important for us to be welcome at AZ and to get close to what the employees experience in their daily work (van Maanen, 2011). These observations were possible since we got extensive access to the AZ site and could move around freely using our own keycards. We also received personal log-ins to the intranet and were thereby able to book meeting rooms, check the employees' calendars and communicate through

the AZ-mail. Observations were made at all the floors at AZ where the ABW-solution was implemented, this in order to comprehend the employees' behavior in the new setting, since the behavior might differ both within the floors and between the floors.

In addition to the interviews and observations, documents were collected for further clarification about the ABW-solution at AZ. The documents include; emails, PowerPoints, brochures, survey results and minutes from meetings. These documents contained information concerning; the change process, information regarding ABW guidelines, figures showing the occupancy level at the different work areas, and feedback from employees regarding ABW. It is important to bear in mind that the documents are affected depending on who constructed them, as well as who the receiver is, since this has an impact on the layout and content of the documents (Silverman, 2013).

Data Analysis
Before our main data collection, we transcribed and analyzed the material collected from the pre-study in order to acknowledge any particular process, theme or tension that was interesting to study. We found that there were different understandings regarding how to use the new office solution; especially when comparing the intended use and the practical use. We therefore focused our investigation on the contrasting views of the different employees at AZ.

As we had a large amount of data to analyze, we took inspiration from grounded theory, the way it is explained by Martin and Turner (1986). Hence, during our study we transcribed and analyzed the collected material continuously. We made use of a computer software called "NVivo 11" in order to sort our data for further analysis. We coded the transcribed material, which included transcribed interviews, transcribed notes from meetings and transcribed notes from observations. The collected documents were also coded but not transcribed as they were already of written format. By including data from all different collection methods while coding, it was possible to compare them to find common ground and also conflicting information in the data.

When we coded our first transcribed data, we did this in an open way and included everything without emphasizing anything in particular. As a result we ended up with over one hundred codes, for example; "clothing", "coffee", "carrying stuff", "looking for desk", "backpacks", "same spot", "chairs", "sound level", etc. Some of the codings were not relevant for our study, and we excluded them at this point. To make sense of the remaining codings, we divided them into wider categories, such as; "ABW intentions", "ABW areas", "different understandings", "different groupings", "guidelines", "informal rules" etc. Still after categorizing we had approximately 30 categories with relevant data. As we had identified what was relevant for our study, we continued our transcribing and coding in a selective manner. Hence, we only transcribed and coded data, especially from the interviews, that were in line with the chosen categories. Finally, we organized these categories in three major themes corresponding to three ABW-areas called; Open work areas, Meeting rooms and Collaboration areas, and related them to theoretical concepts. This process of analysis allowed us to gradually abstract the meaning of the data from being very close to the field to stepwise coming closer to theory. Before presenting our results and analysis of these three areas, it is adequate to provide the reader with a description of the setting since this paves the way towards a deeper understanding of our case study.

The Setting

In 2014, the senior executive team at AZ decided that the company was in need of reducing their green footprint and their costs, which each AZ site was responsible to handle on their own. As a result, the site leadership team (SLT) at AZ Gothenburg decided to close down two office buildings, which consisted of cell-offices, since the site in Gothenburg had more square meters per employee compared to other AZ sites. Consequently, about 250 employees were going to be transferred to the remaining two office buildings, which had to be rearranged to cope with this amount of people. In order to solve this issue, a project group was established with the task of providing an alternative office solution for AZ Gothenburg. The project group identified three different plausible solutions; (1) Hot desking, meaning fewer desks than there are employees, (2) replacing existing desks with smaller ones, and (3) ABW. The project group decided to look more closely into the ABW-solution. In order to learn more about ABW, the project group visited other companies, including Volvo, Saab, Tetra Pak and Sony Mobile, to get a grasp of their approaches on ABW. Drawing on their knowledge gained from these visits and with the input from ABW-consultants, the project group designed a customized ABW-solution that they presented to SLT, which afterwards became approved.

In February 2015, a new project group was established to handle the preparation and implementation of the new office solution. First, they decided on how to approach this change process. They put strong emphasis on letting the employees discover the meaning of the change by themselves, instead of telling them the benefits of this new office solution. Furthermore, the project group aimed to have a voluntary and consultative approach; meaning that the employees were not forced to participate in any preparation activities. Moreover, they decided to adopt a semi-programmed approach, meaning that they had a plan for how to implement ABW at all the floors in different stages but they were open to learn from their experience in order to improve the implementation process throughout the project. Once the project team had decided upon this approach, they informed all the managers, including those that were not affected by the change, about the ABW-solution. Thereafter, they informed all the employees that were going to be affected by the change. Before the implementation, they created a showroom where the employees could read about the change and where they for example could look at the new chairs, desks, lockers and backpacks.

The project group put together an extended team consisting of 25 employees, which included key actors and managers from all the different functions involved in the change process. This extended team played an important role during the whole process by gathering feedback from their different functions and being mediators between the employees and the project team. In addition to this, the project group used feedback billboards in order to collect anonymous feedback from the employees. This feedback was used in order to improve the implementation phase for the next time, but also in order to provide the employees a feeling of inclusiveness through "quick-fixes". For example, the employees complained that there were not enough coffee machines and that they lacked mousepads, these complaints were dealt with straight away.

For each implementation phase they had two introduction weeks. The first week included an introduction and information regarding the upcoming changes and the second week was the start-up week. During the start-up week they made use of "floorwalkers" that could help the employees with IT-problems and ergonomics issues, thus helping the employees to adjust their

chairs and desks. These actions were supposed to facilitate the transition and help the employees to adapt to the new environment. Moreover, the project group made use of ambassadors to be moral support for the employees. Those ambassadors were employees themselves and could have different personal opinions regarding the ABW-solution, yet they all wanted to make the best out of the situation in order to have a successful outcome of the entire change process. Additionally, the project group invited "truth-tellers" to speak in front of the employee's and to share their thoughts and experience of transitioning to an ABW-setting. These "truth-tellers" could also be invited to workshops, which is an additional tool that managers could use in order to make their employees understand the ABW-setting. During these workshops, managers could also use different types of games and exercises to enhance their employees understanding of ABW.

The change at AZ involved a refurbishment of 12 floors located in two different buildings. ABW had been implemented at five floors, which affected approximately 545 employees. Since the previous office solution was mainly open space office, the reconstruction of the floors was not that comprehensive. The main part of the constructional changes was seen in the new restroom facilities, which was necessary due to the increased number of employees at each floor. The ABW-solution applied to all employees regardless of hierarchical position; hence no one had their own desk nor their own office room. Instead of their own desk or room, all employees had their own locker, to accommodate their personal belongings and work material, in an area which they called "anchor point". All employees also received a backpack to be able to carry their equipment around the office, since a "clean desk policy" was applied. This policy stated that "whenever you leave a seat for the day, you should make sure it's clean from any paper, coffee cups and private items. If you leave the desk for just a coffee or a quick meeting, you can leave your things." (Brochure "Welcome to the Future office of AZ Gothenburg", p.4).

The office areas itself changed both regarding the furniture and the design of the floors layout since it was divided into five different working areas. Each area was supposed to attract employees depending on what work task they were about to carry out. The different working areas in AZ's ABW-solution was; (1) High focus area, (2) High focus rooms, (3) Open work area, (4) Meeting rooms, and (5) Collaboration area. Besides those five different types of areas, there were social areas on each floor where the employees were able to socialize and relax. Our results and analysis will focus on three of these areas, namely; Open work area, Meeting rooms, and Collaboration area.

Results and Analysis
Open Work Area
This section provides an explanation about the intended use of the open work area. Thereafter, a description of how the area is used in practice is presented, focusing on different aspects in different subsections. This is then followed by an analysis concerning the process of boundary construction.

Intended Use
The open work areas were "designed for individual low- and semi focused work" (Brochure "Welcome to the Future office of AZ Gothenburg", p.3) and they were the most popular

workstation in the ABW-solution. In the open work area, which reminded of an open landscape solution, there were desks and chairs but also some alternative furniture to be used. This alternative furniture, had high walls covered by textile to reduce distractions from sound and sight. The desks in each workstation in this alternative furniture were fixed, some of them were elevated and therefore suitable for a standing position, whilst others were placed lower and adapted for a sitting position. The regular desks were height adjustable, which made it possible for the employees to choose between sitting down and standing up while performing their job. As described in a brochure, "it is OK to take a phone call in the open work area, but please pay respect to your colleagues." (Brochure "Welcome to the Future office of AZ Gothenburg", p.3). This initiated that the employees were allowed to talk to each other and also to take phone calls, hence there were no guidelines that implied that the employees should be quiet within this area.

Furthermore, the clean desk policy that the employees were asked to follow was complemented with a one-hour rule. This rule advised the employees to remove their belongings from the workstation if they intended to be absent for more than one hour consecutively. The project team communicated these guidelines to the employees through their extended team members and the line and/or team managers. The managers were responsible for making their team members aware of the guidelines; this communication was done through emails and team meetings. There were also information brochures to look at, which could be found in the social area/coffee room, and information printed on paper explained the guidelines for the different areas available at some of the different work areas. The idea was that all floors should have the same ABW-solution with the same guidelines applying to the same areas to make a movement between floors as smooth as possible for the employees.

In Practice: Movement between Floors
All floors were open to all employees regardless of where their anchor points were. Even though this was supposed to be communicated and of general understanding, the employees tended to stick to the floors where their anchor points were situated. One employee said:

> "That is something that we have not been getting any instructions about, regarding how restricted you are to your own floor. Therefore, I am not sure. Do they expect me to stay where my anchor point is, or could I go anywhere I want? I don't know." (Interview at AZ, 2016-02-25)

Even though it was supposed to be a procedure that followed the guidelines for the new ABW-solution, it was unclear to the employees whether it was okay or not to move between the floors. During the study, no one mentioned that they themselves had been moving between the different floors in order to get a desk in the open work area if all the desks were occupied at their dedicated floor. Many employees did not even look for a desk on the same floor if their preferred area was fully occupied. One employee explained:

> "It is extremely segregated here. I used to sit here a lot before, but not anymore. It feels like if you are trespassing someone else's territory when you move between the different areas" (Interview at AZ, 2016-02-29)

Differences between the floors made it less likely that the employees would move between them, and the "segregation" between the groups even reduced the movement at the same floor. This was due to the feeling of "trespassing someone else's territory", thus not knowing the internal rules in that particular grouping, and also since there was no coherence about the guidelines among the employees due to lack of information.

In Practice: Groupings and Sound Level
It became clear to us that there were groupings, or clusters, of employees that tended to occupy the same areas every day. This adhered to high focus areas, high focus rooms, open work areas and collaboration areas. Within those groupings, internal rules of understanding had evolved. This involved the common understanding for how loud you were allowed to speak within the area, regardless of what the guidelines said and what the intended use was. One employee said:

> "What has been a bit of a question mark here is, 'Where are you allowed to talk, actually?'" (Interview at AZ, 2016-03-02)

This employee expressed that there was a shared uncertainty around the possibility of talking or not in the open work areas. In fact, different understandings had developed on different floors. On some floors in the open work area where you were allowed to have conversations with your colleagues, the employees tended to be quiet and if they spoke they tended to use a low voice. On the other hand, at another floor the employees spoke to each other more freely without anyone complaining of being disturbed, i.e. they followed the guidelines as intended. Furthermore, the groupings identified in the study ended up sitting at the same locations in the buildings every day. Some of these groupings basically stuck to their former working routines, meaning that employees sat in the same areas as before the implementation of ABW, but not necessarily always at the exact same desk as before. This behavior was explained by one employee in this way:

> "There is something inside you that is longing for a domicile. At least that is something I want. And that changes now. I think that is what people are afraid of, losing their safe space." (Interview at AZ, 2016-02-25)

Here we can see that one employee expressed a fear of losing a "safe space", and the need to feel safe by having a fixed place to go to. We also heard from other employees that they tended to choose the same areas since they felt a need to sit among people they work with. One employee explained:

> "Those people make a habit of being here rather early in the morning to make sure they will get 'their' seats. I know about four different people that show up early at work. At first they had one favorite desk, later on they had two and then three, so there is a possibility that in the future they might even move between the floors." (Interview at AZ, 2016-02-24)

This quotation shows that employees rearranged their morning routines in order to get "'their'" seats. As already shown, there are different reasons to why employees stuck to the same areas

every day; we also heard from employees that they were still in a "transition period" and were still "learning how to use the ABW-solution" (Interview at AZ, 2016-02-29). Moreover, in specific situations, AZ chose to dedicate desks for a few employees who belonged to certain work teams, for example support teams. Due to the fact that other employees also tended to stick to specific areas and did not move around a lot, this was not known to everyone. Those who did have knowledge about it seemed to have an understanding of the procedure, and the employees who had their own desk areas thought it was convenient and a "success factor" (Interview at AZ, 2016-02-22) for their teamwork. Dedicated desks like this are not in line with a pure ABW-thought, yet it might still have been a necessity to adjust to the specific context at AZ.

In Practice: One-hour Rule and the Clean Desk Policy
As aforementioned, there was a one-hour rule that applied to the open work areas. The one-hour rule was strictly applied at some floors and within some groupings, while it was less strict at other floors and within other groupings. As understood from the interviews, there was a general acceptance among the workers for how to apply the rule, yet the knowledge and understanding of the rule varied. One employee explained:

> "It is mixed I think. As you noticed I brought my bag with me to this meeting, because from here, I have got this meeting and then there is lunch after that and I will be going to the restaurant. So I was thinking that I will be away for more than one hour. But there could be other times when I think 'well it will probably be about an hour' and then I would leave my things. So I think it vary. And I see around me that it varies as well." (Interview at AZ, 2016-02-25)

At some floors and within some groupings, the general idea was to bring your belongings if you were uncertain about how long you would be gone. Based on our observations, it was evident that the awareness of that rule was followed to different extents. The reasons to why there were differences could be many and the presence of managers was one reason. One employee said:

> "If you look at the open work area down there, they seem to stick to the one-hour rule quite strictly. That might be because there are managers sitting there. So they stick to the rules, but we are more rebels in the open work area up here." (Interview at AZ, 2016-02-18)

This statement implies that the presence of managers might have restricted the employees and made them follow the guidelines more accurately and strictly. On the contrary, the absence of managers gave room for own interpretations of the rules and a more "rebel-like" behavior. Furthermore, the understanding of the rule did affect how it was followed. One employee "did not even know about it" (Interview at AZ, 2016-02-29) and consequently did not follow the rule. There could also be other things that were of influence. As one employee explained:

> "If you have been to a meeting for one hour, and then realize that you will have another meeting, and then 'oops, I left my computer and my belongings on the desk'.

Sometimes I remember to remove them and sometimes not, and then they might be there for several hours." (Interview at AZ, 2016-02-29)

This statement shows that the human factor and stress could make an employee unintendedly occupy a desk and be absent for several hours. Therefore, the rule put pressure on the employees to more actively plan their days in accordance to their schedule to be able to stick to the guidelines that adhered to the ABW-solution. At the floors were they intendedly did not follow the one-hour rule, the employees had a problem with setup times. They felt that the time they spent on gathering their belongings, putting them into their backpacks, going to the locker, adjusting the desk and chairs and adjusting the computer screens at a new workstation were too time consuming and it was therefore worth bending the one-hour rule. They also mentioned that the rule could enhance the stress correlated to leaving one's desk. As one employee said:

"I think it would be good to have more desks in the open work area. This would diminish the amount of stress correlated to leaving one's desk and fearing not to finding a free desk when returning from a meeting." (Interview at AZ, 2016-03-02)

This implies that employees left their belongings at the desk to assure themselves of having a seat when they got back from a meeting and that a perceived stress was correlated to the lack of desks in the open work area. As seen above, there were different factors that impacted on whether the employees followed the rule or not. The clean desk policy and the one-hour rule, at this point in time, were a problem to some of the employees. At the same time, the rule was a necessity for the ABW-solution to function as intended with the free movement and the non-personal desks.

Analysis
The new rules that were installed, i.e. the clean desk policy and the one-hour rule, were not followed as intended. One reason was that the guidelines were first written down by the project team and those guidelines were then communicated to the managers. When an idea like this travels between people, there is always room for interpretations (Latour, 1986), which is what happened in this case. For example, some managers did not take this rule strictly and adopted a laidback attitude while some managers did not recall ever hearing about the rules. This indicates that when the managers communicated these rules, the employees received an already translated version of guidelines. This explains why the rules were adopted differently at the floors and also by the different groupings. Drawn from this discussion, we argue that the mental space has changed for some groupings and not for others, since their knowledge of these new rules differed, meaning that their knowledge and sense-making of how to behave in this environment also differed. It was evident that the different groupings formed norms of behavior concerning the new guidelines. This indicates that the social boundaries changed depending on how the rules were translated by both the managers and the clusters of employees.

In the open work area there were no longer personal desks, this change had an impact on the mental and social boundaries. The way that one looks at a desk, for example, depends on former use and understandings. Our findings show that managers were less dependent on desks compared to other employee's; hence their perception of the desks was different already from the

beginning. Since many of the desks were still in the same areas as before, with the difference that no desks were personal, many employees used the desks in the same way as before, hence they did not change their already established mental and social boundaries (Hernes, 2003). Our findings of how groupings of employees tended to sit at the same desk areas as they did before the implementation of ABW, reminds of Halford's (2004) findings from her study on hot-desking were employees tended to occupy the same desks every day. We saw that employees tended to stick to the same desk areas and these areas usually were the ones closest to the employees' anchor point. Since there was no possibility of having a personal desk, this behavior indicates a strive for a domicile, i.e. being close to their lockers where they stored their belongings. Due to such behavior and the fact that clusters of employees occupied certain areas at the floors, employees created a strong relation to that area and created mental and social boundaries for where to sit, which is similar to what van Marrewijk (2015) found when he studied an implementation of a flexible work concept where employees felt mentally bound to certain floors. Several employees explained that they felt the need to sit close to their colleagues since they worked closely together, which created social boundaries. These social boundaries explain the expressed feeling of walking into someone else's territory (Baldry, 1997), since the different groupings had different behavioral norms (Hernes, 2003). It appears that the change in physical space in our case contributed to the creation of stable relations between individuals within groupings, indicating that our findings is a further development of the arguments by Hope (2015), Dale and Burrell (2010), Halford (2004) and Gieryn (2002) as they argue that if physical space stays the same it contributes to stable relations between employees. Hence, our findings show that stable relations are not necessarily dependent on a stable physical space. Moreover, the newly created social boundaries and an uncertainty regarding the possibility to move between the different floors, due to a lack of information and understanding, nurtured a mental boundary, i.e. there is a lack of knowledge about the intended use of ABW.

The open work area, at AZ, was spatially designed almost as it was prior to the ABW-implementation. Thus, the physical space has not changed remarkably in that sense; however, it has changed since physical space also includes formal rules (Hernes, 2004a; 2004b) and since there are no personal desks. The intended use with the new formal rules indicates that a new set of boundaries were introduced to the employees. As seen in our case study, these new boundaries that the project team has constructed were not fully adopted by the employees. Our findings therefore support the arguments by Kerosuo (2003), Rafaeli and Vilnai-Yavetz (2003) and Hirschhorn and Gilmore (1992) that boundaries are not something that management can outline and force onto their employees.

Our study shows that when the physical space changed concerning formal rules, which are changes less visual to the naked eye, the use of the area stays the same as before for some employees. As already argued this was due to individuals' knowledge and sense-making of the rules which were affected by translation processes. This further developed different norms of behavior within the different groupings. Furthermore, our study shows that the non-personalized desks, which are more palpable than formal rules, enhanced the visualization of mental and social boundaries. The relation between employees became more stable within groupings, and different norms of behavior occurred between different groupings. This shows that social boundaries affected how the employees acted upon the non-personalized desks, and that change

in physical space does not per se change behavior but are in need of an interplay with mental and social boundaries.

Meeting Rooms

This section provides an explanation about the intended use of the meeting rooms. Thereafter, a description of how the rooms are used in practice is presented, focusing on different aspects in different subsections. This is followed by an analysis about the creation of boundaries concerning meeting rooms.

Intended Use

On each floor at AZ, there were several meeting rooms. As stated in the brochure, they were "sized for 2 up to 18 persons. Some of the meeting rooms can be booked through outlook while others are drop-in." (Brochure "Welcome to the Future office of AZ Gothenburg", p.3). The largest rooms, which could be booked in advance through outlook, were intended for meetings and team collaboration. Some of the smallest drop-in rooms were called high focus rooms and they were foremost intended to be used for phone calls and online meetings, i.e. telecommunication (TC). The second priority for these rooms was individual and highly focused work. Furthermore, a fifteen-minute rule applied for all the meeting rooms, meaning that if the employees left the meeting room with the intention to be absent more than fifteen minutes, they had to bring all of their belongings, to make it possible for others to "drop-in".

In Practice: Occupation of Rooms

The meeting rooms were used in different ways at the different floors. At one floor they had paper calendars, outside of the drop-in rooms, where employees signed up to book the room in advance. This was the only floor, out of five ABW-floors, that made use of this manually controlled system. Employees at this particular floor argued that the calendars contributed to the meeting rooms not being occupied by the same people all day long. As one employee said:

> "No one has the stomach to book a room all day long, it would be embarrassing"
> (Interview at AZ, 2016-02-16)

Therefore, no one booked a room for a whole consecutive day, partly because it was traceable in the paper calendar, and partly since the rooms were not supposed to be used in that way. However, occupying the meeting rooms for several hours had been an issue at other floors. Employees had observed that meeting rooms had been used for individual work by employees who preferred to sit alone, which contributed to most meeting rooms being occupied, but not being used as intended. As one manager stated:

> "We need to develop certain comfort rules. One could argue that it is common sense when and how to use a room but we all have different norms, that is the reality."
> (Interview at AZ, 2016-02-29)

From this statement we can see that the employees' different backgrounds and personal preferences affected the way they used the meeting rooms, independent of the guidelines for the intended use. Therefore, there was a need to clarify the intended use and to establish

standardized rules. As a result, some managers sent out additional information to their employees regarding that the meeting rooms should be used for TC's only, and that all individual highly focused work should be performed in the high focus areas. One manager explained the drawbacks of this communication channel:

> "We communicate in different ways. Emails in all its glory, but we receive so many emails each day that one might not be enough. There is no sufficient 'welcome-brochure', which I think we are in great need of." (Interview at AZ, 2016-02-29)

As explained here, the communication through emails was not enough. This was due to managers expressing themselves in different ways and since emails easily become unnoticed. Furthermore, the written material available did not cover all the guidelines, which consequently established different understandings among employees. Moreover, employees argued that it was difficult to know if a meeting room was available and this triggered the behavior to reserve the larger meeting rooms for individual use. To deal with this issue, some employees requested an IT-system that could mitigate this problem. As one manager stated:

> "I want an IT-system that is interactive. I want to see when I walk down the hall, or on my phone, where I can find an available room. I also think that an IT-system can help and make people feel less stressed about not finding a room, because people are more inclined to leave if they know that they can easily book another room. I believe that the issue is connected to IT." (Interview at AZ, 2016-03-14)

Drawing on this statement, an IT-system would function as an upgraded version to the aforementioned paper calendars. It would make it easier to find unoccupied small rooms for the TC's, and it would visualize if someone was frequently using the meeting rooms for individual work.

In Practice: Work Tasks and Need of Rooms
Managers spent most of their days in meetings and did therefore not always require a desk. Instead, they were in greater need of either collaboration areas or meeting rooms. However, drawing on our research, managers did not find the lack of available meetings rooms as an issue even though they tended to use them a lot. Managers were more likely to move between the floors, due to their work tasks, as one manager described:

> "I have meetings every day at different floors because my personnel is spread all over the site. I often go to my anchor point in the morning to get my bag but then I spend the rest of my day at different locations." (Interview at AZ, 2015-12-08)

As we can see, managers' work situation encouraged them to move between floors a lot. Consequently, this opened up for a wider range of choices when it came to choose a meeting room or work station. This movement between floors influenced their perception regarding the availability of the meeting rooms. On the contrary, some employees who required a desk most of their time, due to their work tasks, did not use the meeting rooms as much and did not move around to the same extent. One employee said:

> "You always try to find a seat near your anchor point because you want to be close to your locker." (Interview at AZ, 2016-02-22)

This statement shows that some employees limited themselves to certain areas, due to physical aspects, in this case because they wanted the comfort of being close to their anchor point. On the other hand, as shown in the previous section, many employees were in need of meeting rooms from time to time and complained about them being occupied. The need of meeting rooms varied, as one manager explained:

> "Not everybody here at AZ have a lot of meetings. Many people just sit at their desk, and want to do so while performing their job. Therefore, you cannot simply state 'this is how we perform our work at AZ', because it is very different depending on your role." (Interview at AZ, 2016-03-02)

It is interesting to see that the employees' role and work tasks obviously affected their need to use meeting rooms. The managers moved around independent of where their anchor points were, meanwhile the employees restricted themselves to specific areas, since they wanted to sit close to their colleagues and anchor points. Therefore, the work tasks affected the need of meeting rooms and the way employees moved around the office and between floors, this consequently influenced their perception about the meeting rooms availability.

In Practice: Lack of Rooms and Fifteen-minute Rule
The perceived lack of available meeting rooms was not only due to employees using them in the "wrong" way, but also because of the close collaboration with AZ sites in the US. The time difference contributed to meeting rooms being occupied during the afternoon since many TC's took place during those hours. The high pressure on the meeting rooms became a stress factor for the employees and contributed to certain behavior. According to the interviewees, some employees did only look for a meeting room close to their anchor point. The employees thereby restrained themselves regarding which area to look for a meeting room, consequently they did not find an available room. As explained during an interview:

> "There can be an unoccupied meeting room only 10 meters away, but one might not look there." (Interview at AZ, 2016-02-18)

This statement was strongly supported by an occupancy study conducted by AZ, which showed that on average 56.8 % of all meeting rooms were unoccupied (Occupancy study AZ, 2016). However, the general perception among employees were still the same; to assure themselves of having a room for their TC's, they tended to book the larger meeting rooms, as aforementioned. Consequently, a single employee could occupy a meeting room which was intended to be used by larger groups for meetings and team work. Drawing on our data, the general perception at AZ was that there was a lack of meeting rooms which further contributed to the fifteen-minute rule not being followed. As one manager exemplified:

"People leave their stuff or sit there all day because they fear that they will not find a room when they need one in the afternoon. However, such behavior contributes to that most rooms are occupied, there is probably enough rooms if people simply uses the rooms when they actually need one." (Interview at AZ, 2016-03-02)

It is interesting once again to see that guidelines were not being followed due to different perceptions, which contributed to the general perception of occupied meeting rooms. In addition, some of the employees believed that fifteen minutes was too short, which was also why they did not comply with the rule. Some employees argued that they did not follow the fifteen-minute rule during lunch hour if they were in need of a room after lunch. Furthermore, some managers argued that they had never heard of this rule, which explained why some groupings did not adhere to it. As one manager stated:

"I actually did not know about that rule, but I also do not think that it is a problem at this floor. I always feel that it is possible to find a room." (Interview at AZ, 2016-02-24)

As understood from this statement, the compliance to the rules did not necessarily impact the availability of the rooms. Nonetheless, the fifteen-minute rule was known and used at some floors, as overheard during observations, one employee said:

"Sorry, I am in a hurry, I just want to grab a coffee real quick because I already took a room for my TC and I cannot leave it for too long." (Observations at AZ, 2016-02-15)

Our observations show that the fifteen-minute rule has been communicated clearly to some groupings, and that some employees therefore followed it more strictly.

Analysis
Most employees perceived that there was a lack of meeting rooms, which can be explained by the way the meeting rooms were used. Some employees preferred to sit in a room all day, which could be because they came from one of the buildings that were closed down where they had their own cell office. Conclusively, the employees' pre-understanding of how meeting rooms are supposed to be used influenced the way they made use of the meeting rooms in the new office solution. The perceived lack of meeting rooms is connected to the restricted movement between and at the floors, which reminds of van Marrewijk's (2015) findings about employes constraining themselves to certain areas. The social and physical boundaries restrained employees to stay close to their lockers and colleagues and this reduced the employees' range of available meeting rooms, which consequently nurtured their feeling of the high occupancy rate.

To manage how employees used the meeting rooms a new formal rule was introduced, namely the fifteen-minute rule, i.e a new physical boundary. The fifteen-minute rule was affected by the translation process which in turn affected the way meeting rooms were perceived and used. The project team developed this rule and communicated it to the managers who translated this differently; some decided to not inform their employees about the rule and some

communicated it to their employees. Drawn from our case study, we acknowledge that the different floors and different groupings employed the rule differently, which is not strange as they received different information from the managers due to the translation process.

In addition to this new formal rule, another physical boundary was the paper calendars that was present at one specific floor at AZ. By making use of paper calendars and maybe an IT-solution in the future, the practical use of meeting rooms was more in line with the intended use. This was because the physical space was different, which Baldry (1997) and Hope (2015) argue influences the social and mental space. Since physical space can be used as a control mechanism according to Baldry (1999), management indirectly steered employees into certain behavior by making use of paper calendars. When making it visual to others in the paper calendars, the employees became socially restricted and did not occupy a room longer than necessary, due to a perceived pressure to socially behave in order to not feel embarrassed. This indicates that the employees were bound by their thoughts regarding norms of behavior (Hernes, 2004a; 2004b), and that they did not want to transcend nor construct new social boundaries. This implicates that artifacts such as paper calendars have an influence on how the employees behave in the new environment and thus also influence the mental and social boundaries.

Collaboration area

This section provides an explanation about the intended use of the collaboration areas. Thereafter, a description of how the area is used in practice is presented, focusing on different aspects in different subsections followed by an analysis combining theory and empirical data to explain the construction of boundaries. The collaboration areas at AZ's different floors included both workstations in open space areas and meeting rooms. Since the intended and in practice use of the meeting rooms have already been described and discussed above, this section focuses on the open space areas solely.

Intended Use

The collaboration areas at the different floors at AZ looked quite similar, independent of the construction of the buildings. There were tables of different size, suitable for 4 up to 12 employees, with the possibility to both stand up and sit down. In addition to these tables and chairs, there was alternative furniture, such as sofas, that was supposed to be used for shorter periods of time, for example in between meetings. Other alternative furniture was more suitable for meetings, for example, there was furniture which included two sofas separated by a table facing each other with walls covered by textile surrounding them to eliminate distraction from sound and sight. The collaboration areas were supposed to be used for meetings and team work, and there were no restrictions regarding how much the employees were allowed to talk to each other. This area should "encourage employees to interact, cooperate and collaborate with each other in order to learn from each other" (Interview at AZ, 2015-12-08).

In Practice: Overflow Area and the Influence of Time

The actual use of the collaboration area did not completely reflect the intended use of the area, which could especially be seen in the beginning of the new office solution implementation. As one employee said:

> "The collaboration areas were used as a 'slasktratt' (overflow), people only sat there when all the other places were occupied." (Interview at AZ, 2016-02-26)

It became clear that the collaboration areas were equally, if not more frequently, used by individual employees working on their own as by two or more employees working together. This was supported by another employee who stated:

> "In the beginning there was actually not at all many people using the collaboration area, I think I was the only person sitting there. And people asked me; 'Do you sit there because you cannot find a desk, or because you want to sit there?' and it was a bit of both. But lately I have noticed that there are more and more people over there. But in the beginning there was barely no one." (Interview at AZ, 2016-02-29)

It was interesting to see that the aspect of time affected the use of the areas. The collaboration areas, particularly in the first weeks after the implementation, were used as a place to sit if employees did not find a desk elsewhere. During our observations, it was possible to identify an influx of people and an increase of collaboration in the area over time. In comparison, the collaboration was more palpable at those floors that were included in the first implementation-phase, six months earlier. This supports the idea of the influence of time and that employees were still learning how to use the ABW-areas.

In Practice: Alternative Furniture and Sound Level
The alternative furniture was used as intended most of the time, even though it was not being used that much if looking at the statistics from the occupancy study. Yet, this statement from one employee supported the intended use, in one aspect:

> "Because we do not really have that much collaboration areas, actually we only have the 'tågkupéerna' and the red sofas. I would say that these areas are very much used for individual work, if someone do not find a desk, or if they are here for only 15-20 minutes, before going somewhere else." (Interview at AZ, 2016-02-18)

As we can see in this statement, the furniture was used for shorter periods of time just as intended. It was also used mostly by individuals instead of by several collaborating employees, which supports the previous paragraph and does not go in line with the intended use. Some employees who sat in this area made a habit of using the area in this way. Nonetheless, there were still collaboration and meetings taking place in this area, just as intended, but not to the same extent as the individual work. Since the aforementioned behavior of mostly individual work was more common in this area, the sound level was rather low. As one employee said:

> "One of the more quiet areas is actually the collaboration area. Since there are not many people sitting there, naturally it becomes quiet." (Interview at AZ, 2016-03-02)

This statement shows that the area was not very busy, which reaffirms the results of the occupancy study. A low number of employees who used the area, mostly performing individual work, contributed to a low sound level and low collaborative action.

Analysis

The physical space of the collaboration areas did change the most, when compared to the changes in the other ABW-areas. Consequently, this area was the least similar to the former office solution. The building as such was still the same as before, with the same walls, floors and ceilings. Hence, the physical barriers were intact, but the furniture and guidelines for this area were new to the employees. The fact that the design of the area had distinctly changed, together with the materialized guidelines which should promote a deeper understanding, this area should theoretically, according to Baldry's (1999) and Hope's (2015) findings, make it easier for the employees to adapt to the new setting since the office layout is said to communicate how employees shall behave. On the other hand, since the new physical design and the guidelines were farfetched from the former practices of working, the translation process needed further time before the intended use, or a version of the same, could be realized. We thereby support van Marrewijk's (2015) arguments that a change in spatial design has an impact on the change process since it takes time for employees to let go of already established mental and social boundaries. The area was said to be designed in order to trigger collaboration, however, the actual behavior in the area was shown to be individuals working quietly on their own. Still, in line with Hernes' (2004b) arguments, the physical space created repetitive behavior since the same people tended to use this area frequently. The way those employees translated the idea of the use of the area affected other employees' mental and social boundaries. The physical space, in this case, was therefore less influential than boundaries of psychological character.

The employees knew about the guidelines, and that the area was supposed to be used for collaboration. Still, since the general idea among employees was that the area was being used as overflow when all desks in the open work areas were occupied, the mindset about the area became a mental boundary on its own. This mental boundary evolved from the employees' understandings of the area and their thoughts about how it should be used, which influenced how they practically used the area. The use of the area reminds of the concept of mimesis (Czarniawska, 2002; Lindberg, 2002); when one employee performed individual quiet work within the area other employees tended to do the same and imitating behavior overruled the guidelines for the area. Moreover, the mindset that the area was used as overflow nurtured a feeling that the area should be neglected and seen as a second, or even a third, choice after the open work areas and the meeting rooms. Those mental boundaries, which were built up by thoughts and sense-making regarding the area, generated a social coherence among employees.

The everyday activities are highly influential when it comes to how the boundaries are shaped (Kerosuo, 2003; Paulsen, 2003), which was seen in the way the area was being used. People who frequently used the area for individual work, did this due to personal preferences (Halford, 2004) and preferred individual quiet working. By acting in this way they established social boundaries in the sense of norms of behavior. Even if the employees knew about the formal rules (the physical boundaries) and therefore had the knowledge about how to use the area (the mental boundaries), it was still the norms of behavior (the social boundaries) that affected how they used the area in practice. In our case, the action that took place in the area, and the mindset regarding the area, depicted the way that the area was used in practice.

Discussion

In the analysis sections above, which adhere to the three ABW-areas, different aspects have shown to be of importance in the change of the physical boundaries and their interdependence with mental and social boundaries. We will henceforth look at three different degrees of physical change and their interplay with mental and social boundaries. The degree of physical change is related to the visibility of the change: (1) A low degree of visibility can for example be changes in formal rules as in our case relates to the open work areas. (2) The role of artifacts in physical space is to enhance the visibility of a physical change. In our case the paper calendars played such a role. (3) A high degree of visibility adheres to changes that are directly seen in the physical space, as the changes that adhered to the collaboration area in our case study. A common ground regarding these three aspects has emerged, namely the aspect of time, which is further explained and visualized in an illustration.

Low Degree of Visibility of Physical Changes

Physical boundaries include physical barriers, formal rules and electronic devices (Hernes, 2004a; 2004b). When the emphasis of a physical change is related to formal rules, the change is less obvious to the naked eye and more difficult to comprehend, compared to for example refurbishing or moving walls. Therefore, stronger emphasis needs to be put on psychological boundaries in order to realize the new boundaries connected to the physical change. Mental boundaries include thoughts, knowledge and sense-making (Hernes 2004a; 2004b). When formal rules are implemented, the translation process affects mental boundaries of the employees who have their own sense-making of the formal rules. This is why physical change is not always realized and physical boundaries are not always acted upon. As social boundaries include bonding, identity formation and norms of behavior (Hernes, 2004a; 2004b), we argue that actions related to physical boundaries are in fact related to social boundaries, since norms of behavior are more closely connected to actions taken by individuals. Since mental boundaries in the form of knowledge vary between employees, a common understanding of how to use the physical space can only be realized by action; hence the social boundaries are defined by norms of behavior created by common understandings. Therefore, norms of behavior (social boundaries) overrule the knowledge (mental boundaries) of formal rules (physical boundaries). Conclusively, we argue that social boundaries in the form of bonds between employees and the identity formation are more important to individuals within a group than physical boundaries imposed externally.

The Role of Artifacts in Physical Space

Artifacts can be used in order to impose physical boundaries and behavior (Gieryn, 2002; Dale & Burrell, 2008), and according to Latour (1986) artifacts help to clarify ideas and create better understandings. Artifacts can also be used as an image of action and action can be fostered by materializing an idea (Czarniawska & Joerges, 1996). While this is true, the artifacts which establish visual physical boundaries will not be acted upon without the support of psychological boundaries; hence an interplay between different boundaries are of importance. Drawing on our study, we argue that physical boundaries materialized as artifacts will not on their own affect the action of individuals, it is rather the interplay between mental, social and physical boundaries that encourage action. This interplay can be explained by an example; the paper calendars at AZ

did not on their own impose action, rather the employees' thoughts about how to be perceived created norms of behavior that fostered action traceable to the visualization of the calendars. Hence, a mental boundary, in the shape of a thought, is restricted by a social boundary, in the shape of norms of behavior, which in turn are restricted by physical boundaries materialized as an artifact. Action related to this visualized artifact is only realized through the aforementioned interplay between mental, social and physical boundaries. The visualization of artifacts enhances the rapidity of the actualization of the interplay between the physical and psychological boundaries. Is this why a physical boundary in the shape of an artifact fosters action more rapidly than a non-materialized one, such as formal rules, or was this only true in our specific case?

High Degree of Visibility of Physical Change

Significant changes in the physical environment communicate more clearly how to behave, as shown in previous studies (Baldry, 1999; Hope, 2015). Drawing on our research, behavior is more connected to individual psychological boundaries and individuals' perceptions of action in their surroundings. A translation of an imitating manner appears, in line with Czarniawska's (2002) mimesis concept. This is due to lack of pre-understanding about the new physical space, since the new environment is comprehensively changed and the objects in the physical space do not remind the employees of any former translation procedures. Hence, they have no understanding for how to act upon the objects at hand, which is why an imitating behavior occurs as a substitute to absorb new knowledge. This does not incline that everybody acts exactly the same, since individual translation processes affect people's behavior (Lindberg, 2002). Sense-making of other's behavior creates mental boundaries, which triggers social boundaries in the form of norms of behavior. Norms of behavior that occur in a comprehensively changed physical space is established by pre-knowledge of how to behave in similar physical spaces, meaning that pre-understandings in combination with new rules or guidelines foster actions taken by the different employees (Sahlin-Andersson, 1996). Norms of behavior are realized by a group of individuals in order to create a sense of belonging (Hernes, 2003; Paulsen, 2003). This discussion indicates that psychological boundaries overrule physical boundaries, once again, even though the physical boundaries are comprehensive and visualized.

The Aspect of Time

The aspect of time determines when boundaries are realized, since mental, social and physical boundaries change with different pace, simultaneously as the interplay between them are of importance. Psychological boundaries are lagging behind when physical boundaries change; hence mental and social boundaries change in a slower pace compared to physical boundaries. The interplay between the mental, social and physical boundaries is of great importance, and they can be argued to be interdependent. At times it appears as they are working against each other, meaning that mental and social boundaries are far from aligned with the original idea of the new physical boundaries. In our case study we have acknowledged that changes in physical boundaries, of all kinds, are not acted upon since the mental and social boundaries do not change accordingly. Drawing on our discussion about artifacts and looking at Latour's (1986) arguments about the impact of material objects for human action and understanding, we agree that physical objects and boundaries create action but argue that they do not affect the action per se since

mental and social boundaries give the artifact its ability to foster action. We argue that physical boundaries are possible to change rapidly and markedly; but since the mental and social boundaries need more time to change, the interplay between all three boundaries continuously construct new boundaries, which do not completely go in line with the intended boundaries of the initial physical change.

To visualize the aspect of time in the process of boundary construction, we hereby present an illustration which draw on our discussion regarding a low degree of visibility of physical change. The illustration includes two different dimensions; Time and Degree of alignment to the original idea. The aspect of time refers to that boundaries merge over time; hence the more time that goes by, the closer to each other will the different boundaries be. The degree of alignment to the original idea illustrates how close the different boundaries are to the initial idea and how they move towards or away from the initial idea depending on their starting point. It is important to bear in mind that our illustration does not intend to show that there is an end to the process of boundary construction, since it is a continuous process, but it still helps to visualize our arguments. Furthermore, this illustration should not be seen as a general applicable model, but rather as an instrument for us to explain our arguments regarding boundary construction in our specific case and context.
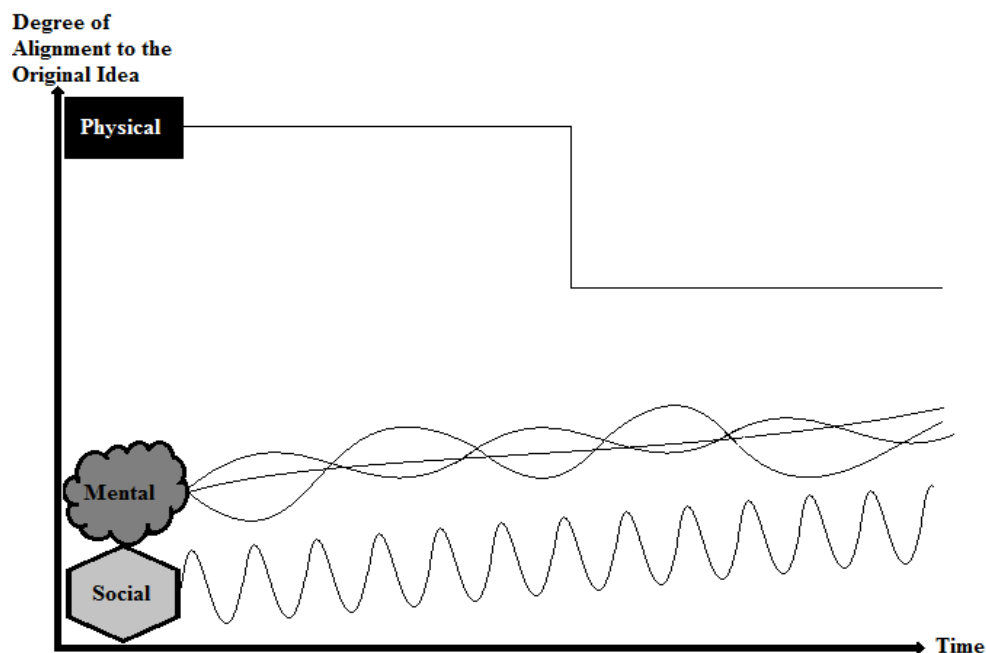

Illustration: Low degree of visibility of change in physical space

The illustration shows the process of boundary construction when less visual changes in physical space are made in the form of formal rules, which reminds of the open work area in our case study. If focusing on the physical boundaries we can see that its starting point, in the illustration, holds a high degree of alignment to the original idea due to that the change is initiated through the establishment of formal rules. The straight character of the line is to illustrate that physical boundaries are of a stable character. Since the formal rules were vague in its initial form they were modified after some time to better suit the context at hand. This is seen in the drop of the line in the illustration above, which inclines that the physical boundaries have changed and

moved away from the initial idea. The reason to the drastic change, as seen in the drop, is because physical changes are possible to actualize in a short matter of time.

If looking at the mental boundaries, we can see that its starting point in the illustration holds a rather low degree of alignment to the original idea due to that people have different knowledge and pre-understandings. The pre-understandings are more in line with previous knowledge and people therefore follow former physical boundaries. If tracing the development of the mental boundaries there are several lines to be followed, which illustrates that different people have their own mental boundaries. We can also see that those lines are not straight nor similar to each other but instead they are fluctuating to different degree. This is due to that knowledge and sense-making affect the process of the mental boundaries development and also since people have different understandings. The fluctuating character of the lines further illustrates that mental boundaries change in a slower pace. The lines have a slightly upward sloping character, which is because of new information that were imposed externally increased the knowledge of the original idea.

Moving on to the social boundaries, we can see that its starting point in the illustration holds a very low degree of alignment to the original idea. This is due to that the norms of behavior and the common understanding regarding the physical space are deeply rooted and do not change due to a change in formal rules. If tracing the line, we can see that it has a fluctuating character, which is related to the mental boundaries, since social and mental boundaries are both of psychological character and therefore influence each other. Furthermore, the extremely fluctuating character of this line are to illustrate the very slow pace of which social boundaries change. This is because social boundaries involve norms of behavior which are usually established over a longer period of time. The upward sloping character of the line show that the social boundaries move closer to the initial idea over time since they are influenced by the mental boundaries that moved closer to the original idea due to new knowledge.

If looking at the starting point of the different boundaries we can see that they are far apart and at this point in time there are a lot of friction between them since their alignment to the original idea vary. When tracing all the lines in the illustration we can see that none of the boundaries end up on the same degree of alignment to the original idea. Yet, the friction between the boundaries are lower since they are now closer to each other. This illustrates that boundaries merge over time and a similar understanding of a translated version of the original idea have been constructed. As seen in the illustration, the physical boundaries have moved more towards the mental and social boundaries than vice versa, this is due to that the action that takes place are more connected to already established norms of behavior than externally imposed formal rules; hence social boundaries overrule physical boundaries when there is a low degree of visibility of physical change.

Conclusions

The purpose of our research has been to study how boundaries are constructed and how they are interdependent by adopting a translation perspective. Drawing on our case study, we argue that physical objects are highly involved in translation processes, as argued by Latour (1986), due to the fact that spatial configurations contribute to different actions from the employees at AZ. However, this case study also shows the significance of social and mental boundaries when physical boundaries are changed. It is evident from the empirical findings that management

cannot force their boundaries onto employees, which is in line with Kerosuo's (2003) and Hernes' (2003) arguments. As seen in this case, the employees did not adapt to the new way of working, which could be because the employees still perceived the spatial configurations in some areas the same way as before due to pre-existing mental and social boundaries (Paulsen, 2003). Particularly, if looking at the open work areas, internal rules and common understandings among employees overruled the new formal rules and guidelines. Hence, mental and social boundaries overruled the physical boundaries, which stands in contrast to what Baldry (1997) and Hope (2015) argue since they emphasize the impact the physical space has on the mental and social space. If looking at the physical boundaries regarding meeting rooms, and in particular the paper calendars, they fostered certain behavior. This behavior was highly connected to social boundaries, since the norms of behavior influenced how the physical boundaries were translated and acted upon. The importance of social and mental boundaries was also evident in the collaboration area since employees rather imitated each other's behavior than following the new formal rules and guidelines, which is in line with Czarniawska's (2002) arguments about mimesis.

We conclude that creation of boundaries is highly dependent on translation processes, which take place in the everyday work life and interaction between employee's. We further conclude that the aspect of time influences the construction of boundaries, as the boundaries are of different character and develop in different pace. This has been explained and further shown in our illustration, which shows how physical, mental and social boundaries merge over time. Physical boundaries can be seen as something that is mutual for all employees since they are of tangible character, mental boundaries are based on the individual as they are of psychological character and social boundaries are constructed by interaction and relations between individuals. Could it thus be the complexity and the intangible character of mental and social boundaries that made researchers neglect them from time to time? As seen in our case study, these mental and social boundaries seem to be the root of the actions that are fostered by the physical boundaries; hence, the mental and social boundaries give the physical boundaries its tangibility.

Managerial Implications and Future Research
Our research has shown the importance of the relation between physical, mental and social boundaries, thus supporting previous research (see Hernes, 2004b). The employees at AZ had a large impact on how boundaries were constructed during the ABW implementation. In fact, it appeared that employees had a larger impact on boundary construction than what the project group's formal boundary setting had. This despite the fact that the project group applied many help activities in order to smoothen the transition to an ABW-office solution. Our case is therefore an example of how difficult it is for management to prepare employees for a change and that externally imposed boundaries are unlikely to be followed directly. The aspect of time is of importance when a new office solution is being implemented since employees need time to translate and cope with a new setting, yet the intended use might never be realized in practice since translation is a continuous process. It is therefore necessary for managers to continuously acknowledge the employees' understandings of the new boundaries and adapt to the context at hand, to be able to get as close to the intended original idea as possible. A standardized set of rules could help to reach the intention of a change, if they are standardized in accordance to the context and employees' needs. For example, if the new idea is to enhance collaboration,

managers needs to keep striving for that and adjust the idea over time to suit the context. For managers, it seems to be a question of finding the balance between steering and listening in order to establish common understandings about boundaries in an organizational context.

A limitation of our research was the time restriction. For future research, it would therefore be interesting to study the entire process of an ABW-implementation and to trace the boundary construction for several years to investigate if boundaries become stabilized in a more general manner over time. Hence, a longitudinal approach would be applicable in order strengthen our findings about boundary construction.

Notes

All citations provided in this paper have been translated by the authors, from Swedish to English.

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