

Office Design

Applying Lynch's Theory on Office Environments

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At every instant, there is more than the eye can see, more than the ear can hear, a setting or a view waiting to be explored. Nothing is experienced by itself, but always in relation to its surroundings, the sequences of events leading up to it, the memory of past experiences.

Lynch (1960), *The Image of the City*, p. 1

A large part of the working population spends at least 40 hours per week at work in offices. Thus, the work environment at the office exerts a significant impact on everyday life for many people. The importance of the physical environment at offices is reinforced by research which shows that office employees' satisfaction with the physical environment at the workplace to a great deal determine job satisfaction and possibly also performance (Sundstrom, 1986, p. 78).

The design process of office environments has mainly been focused on the functional aspects and needs of "the running business" and frequently this is not done in connection with the perception and use of space by the employees. Their perception of the environment ought to be considered in the design process since it most likely has an impact on human behavior, satisfaction and performance (Mitchell McCoy, 2002; Sundstrom, Burt, & Kamp, 1980), aspects which are fundamental for a well functioning work organization.

Office environments are traditionally analyzed from either a spatial organization and functional perspective (Hillier, 1996; Hillier & Hanson, 1984) or from a work environment perspective (Söderberg, 1993; Wolger & Wiedling, 1970) This paper focuses on finding a method to attain a better understanding of how employees perceive and use their office environment from a psychological perspective.

The method investigated was originally developed by Kevin Lynch (1960) and designed for analyzing architectural qualities in cities as perceived by the users. In this paper the same method is used but for the analysis of office environments. The reason for choosing this method is simply that it is based on the users' perception of an environment. The aim is to investigate how useful it is interior space, and in this case three different office environments. The hypothesis is that with a well functioning tool, based on the perception of the users, better workspaces will be created.

The physical environment can most likely be designed to reinforce human behavior and well-being (e.g. Cohen, Evans, Stokol, & Krantz, 1991, et al.). This makes it important and of interest not only for architects, direct users and clients of architectural services, but also for the general public. The key question is how we then transfer the users' perception and use of space into the design process of architecture.

The hypothesis is that Lynch's method could be a useful tool since it is partly based on graphical illustrations. Graphical presentations are by tradition a method used by architects to present information and a way of communication. The method could therefore easily appeal to architects and be useful in their work. The other important component of Lynch's method is the in-depth interviews, which contribute qualitative knowledge about the users' perception and give valuable information in addition to the sketch maps, made by the respondents. The final graphical presentations should therefore be regarded as conclusions of an environmental investigation based on both an in-depth interview and a sketch map made by the respondent.

Human behavior in the work environment is difficult to investigate since it is a complex interaction between the individual and the physical workspace as well as a social interaction with employees. For individuals, interactions with the features of the physical work environment may be evaluated in terms of levels of arousal, adaptation, fatigue, stress, safety, and security (Mitchell McCoy, 2002). The perception of the environment based on these aspects are in focus in stress research, which emphasizes the organism's perception and evaluation of the potential harm posed by an environmental stimulus (e.g. Selye, 1958). The physical environment as a stimuli may be reduced or modified in different ways. Stress arises out of a person's response to the environment (e.g., Cohen, Evans, Stokol, & Krantz, 1986; Cohen et al., 1991; Wohlwill, 1973, et al.). I argue that being aware of this influence is important in the design process and makes it essential to find a method that captures the users' perception for the process. An example of an environmental stimuli that can cause frustration and potentially result in negative physical and psychological effects on the individual is disorientation (Carpman & Grant, 2002; Weisman, 1981; Wener & Kaminoff, 1983). Physical effects also influence our behavior and collaboration with others. For groups, interaction with the features of the physical environment is evaluated by levels of communication and collaboration, status and identity and crowding or privacy (Mitchell McCoy, 2002).

The concept of "imageability" in interior environments

We know that the environment is perceived and evaluated in an emotional way; by *perception*, which is based on im-

pressions we get through sight, hearing and touch, as well as by the *intellect*. The intellect evaluates the environment through *cognition*, which is based on knowledge, thought and memory. For example a door is first recognized, and then understood and interpreted as a door with its specific function. The creation of an environmental image is a two-way process between the observer and the observed (Lynch, 1960, p. 118).

The concept of "imageability" is fundamental in Lynch's theory. The "imageability" is defined by Lynch as the "quality in a physical object which gives it a high probability of evoking a strong image in any given observer" (Ibid, p. 9). It is a physical quality, which relate to the attributes of identity and structure in the mental image of the user. It is determined by *shape*, *color* and *structure* in the physical environment. These are hence regarded as tools to be used to enhance the "imageability" of a place. A highly "imageable" environment is well formed, distinct and remarkable, according to Lynch. It invites the eye and ear to greater attention and participation. In contrast, low "imageability" in an environment is manifested in dissatisfaction, poor orientation, and an inability to describe or differentiate its parts by long-term users (Ibid, p. 32).

Lynch uses five different elements to measure the "imageability" of a space; *landmark*, *node*, *path*, *edge* and *district*. In this paper the elements are used by their original definition, though translated to an interior space context. Some adjustments have however been done to the definitions of path and district. Path is interpreted by the author as paths as well as corridors in interior space. Also, the term district is replaced by the terms zone and area. District refers to an area that is big in scale and is therefore less suitable for an interior space. It is necessary to point out that some of the elements, such as edge and district (here referred to as zone/area) can easily be translated to social or organizational patterns. Lynch admits that such social connotations to districts do exist (Ibid, p. 68).

1. *Landmark* is read as targets or an objective in a space. It is regarded as a reference point for orientation. It is remarkable by its clarity of general form, its singularity and contrast with its context or background. Lynch talks about columns and spheres as significant landmarks. He even talks about details such as doorknobs as landmarks, however for a doorknob to be perceived as a landmark

it has to have some outstanding feature. Landmarks can be found in interior space as well as exterior space. What is crucial to a landmark is its location; the spatial setting must allow it to be seen. If it is small – this is even more important. Certain zones receive more perceptual attention such as placement of an object at eye-level. The intention of a landmark is to intensify perception; landmarks are distinct, unforgettable and not confused with any other object/target. I argue that a landmark can be read as an orientation target in an interior space (Ibid, p. 48, p. 78–81, p. 100–101) .

2. *Node* is a junction of paths and corridors in interior space. It is a place where there is a concentration of some characteristics, a focus in which the observer can enter. (Ibid, p. 47–48, p. 72–75, p. 102–103)
3. *Path* is an element such as a road or a narrow path, according to Lynch. In interior space it can be read as a corridor or a path in an open space. Lynch states that “people tend to think of path destinations and origin points” (Ibid, p. 54). Paths with clear and well-known origins and destinations have strong identities and hold the interior space together. Objects along a path can be arranged to sharpen the effect of a motion along a path and make its course more visible. (Ibid, p. 47, p. 49–54, p. 96–99)
4. *Edge* is one or more elements which make a border between different zones more clear and may, like paths, have directional qualities. According to Lynch edge elements are “although probably not as dominating as paths, [...] for many people important organizing features, particularly in the role of holding together generalized areas” (Ibid, p. 47). In an exterior space, for example, an edge can be a row of houses, and in an interior space it can be a wall or a row of objects as well. Strong edges are not necessarily impenetrable. They can sometimes resemble uniting seams rather than isolating barriers. (Ibid, p. 62, p. 65–66)
5. *District* is, according Lynch, an area with clear, common features which distinguish it, and enables the observer to mentally go inside. In this paper the term *zone* and *area* is used instead of district (see former explanation). Examples of distinguishable features are spatial characteristics, concentration of vegetation, or special features such as unique materials or specific architectural details

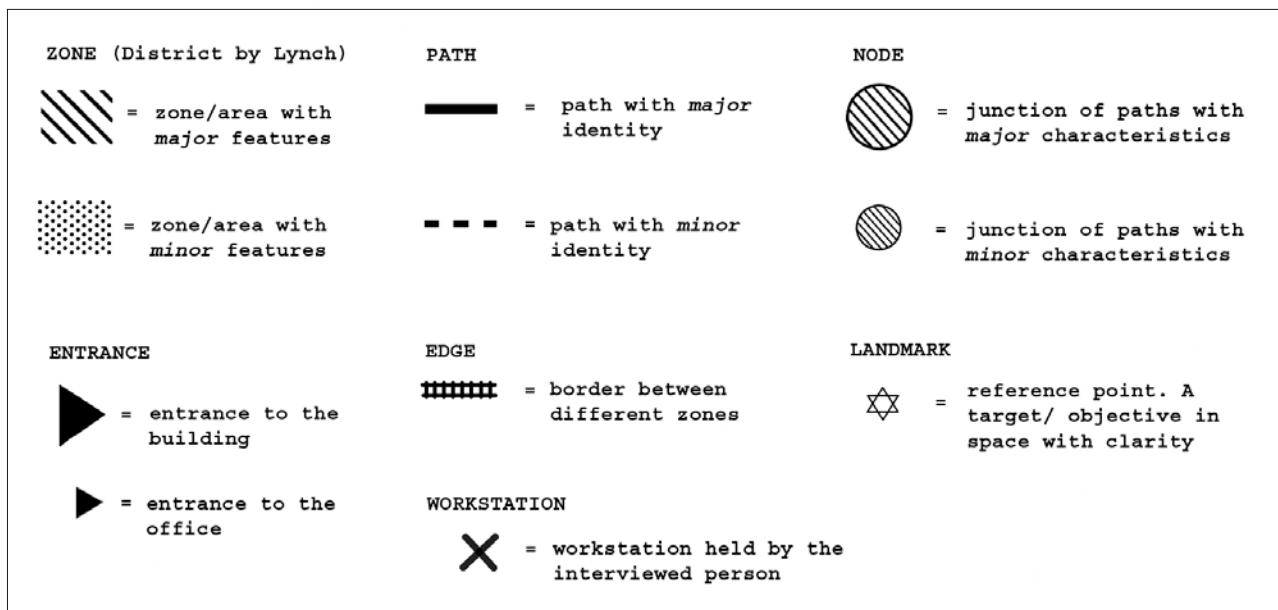
on for example doors and windows. Normally these features occur together and reinforce each other. (Ibid, p. 47, p. 66–68)

Method

The fact that Lynch’s method was designed to evaluate architectural qualities in urban and big-scaled outdoor environments should not be an obstacle for using it to analyze interior environments. It is however important to notify that the urban townscape is “owned” by all users in the sense that it is public and free of use. The formal ownership can be ascribed to the community, which consists of the citizens who are also the tax-payers and main users. With regard to office environments the ownership is held by the company that holds the office, and it is not free of use either like urban townscapes often are.

In this paper Lynch’s theory is applied to the analysis of three different offices with different plan layouts. The three offices are chosen from a sample of nineteen in-depth interviews with employees from different offices. The interviews were based on the questions Lynch and his co-workers used in their work and modified for the perception of office environments. All the respondents were interviewed one to two hours about their perception and “mental image” of their workplace and they were also asked to draw “mental maps” of their offices according to Lynch’s method. Each respondent has had his/her name changed in the paper in order to remain anonymous. The interviews are interpreted and analyzed based on Lynch’s theory and the five elements landmark, node, path, edge and zone, which according to him measure the “imageability” of a space.

The reason I chose to analyze these three specific offices each represented by one respondent is the fact that they represent small as well as big offices. They also represent different plan layouts, one is an open plan layout¹, and two are cell-offices² with individual rooms. All nineteen respondents’ descriptions and “mental maps” could have been used just as well in the analysis, however these three respondents were very verbal and used “spatial terms” when they described their office environments. One can naturally question these criteria for selection; however they made it easier to translate the interviews to Lynch’s definitions and also left less space for interpretation and speculation. The fact that these respondents were verbal and described their



Legend for Figures 1 to 3

offices in vivid manners made the work more enjoyable as well. An advantage for the comparison is that the three respondents hold independent office jobs in different market sectors such as telecommunication, technical engineering and economics.

Since the basis of my analysis of each office environment is a verbal interview and mental map from a single respondent at each office it cannot be used as a general assumption for each office type, or even for the specific office. The analysis should in this case be viewed as an example and each one of them as highly individual conclusions, based on the perception of one single individual at each office. The interviews have been translated into a graphic diagram of each office plan layout, according to Lynch's method. The diagrams show: 1) the function of the spaces and 2) the perception of the space in a plan layout.

Graphical definitions

The graphical presentation of the elements *path*, *node* and *zone* is done in two levels in the diagrams. The term *major* is defined as a strong perception and a perception is defined as strong when the respondent has used strong and vivid expressions in his/her vocabulary to express experiences around the specific characteristic. The term *minor* defines a

weaker perception, which is defined by a less vivid vocabulary concerning the characteristic expressed by the respondent. In such cases the respondent only briefly touched the characteristic during the interview. When elements are left out in the graphic diagram they have not been mentioned by the respondent during the interview, and are interpreted as if they have no meaning to the respondent in the perception of the specific office environment.

Cases

The plan layout sets the framework for zones, rooms, corridors and other physical aspects such as design elements, windows, doors and architectural details. The plan layout determines the placement of windows and thereby influences the visual condition of a space. The layout determines the borders of the space. Single physical objects are less dominant, but can be used to reinforce the "identity" of a place to make a landmark. Based on the importance of the plan layout there are three different interpretations of how office environments are perceived presented here:

Cell-office in a small single room plan layout

Ann is a young engineer and she has only been at the firm for a year. She holds a personal room in the office (see Figure 1).

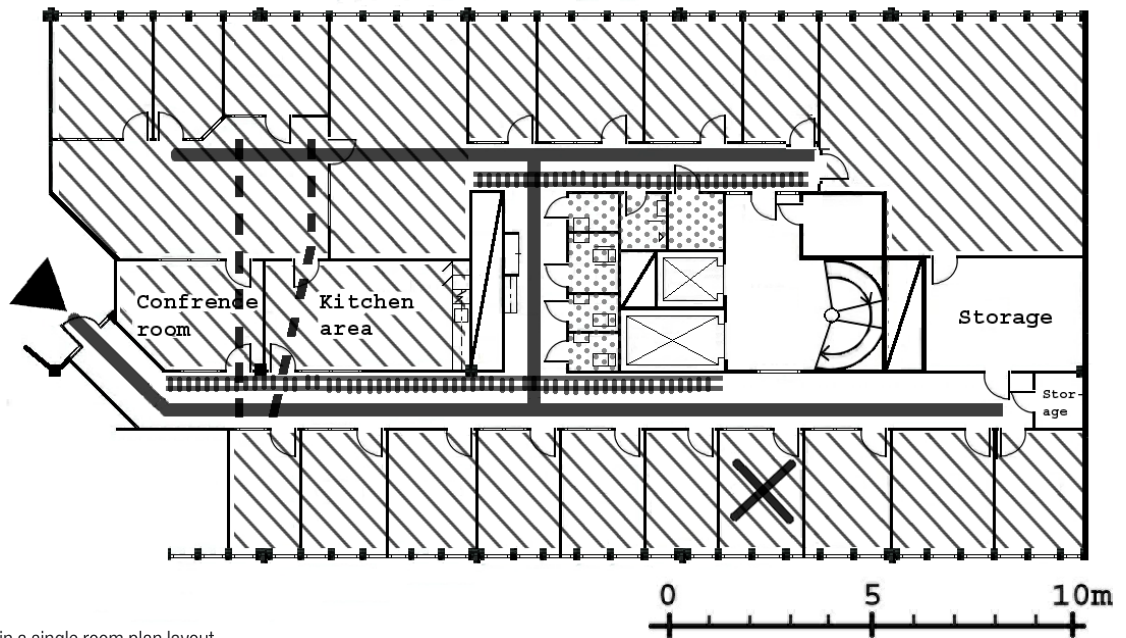


Figure 1. Cell-office in a single room plan layout

Ann describes her office with one single word – corridor. The system of communication is the most significant feature of the office – it’s the backbone for the whole office. I have interpreted this system of communication as *paths* that connect the different areas of the office. Ann’s first impression of the office was that it was closed and messy. The corridors are not only used for communication but also for storage since there is a lack of space for storage at the office. There are two parallel corridors on each side of a dark core in the middle of the building. There is a main path combining the two parallel corridors in the middle and two minor paths crossing the conference room or the kitchen area. These are used as shortcuts.

Ann finds the office somewhat enclosed, even though most of the people keep their doors open and there are windows from most of the rooms to the corridor outside. She explains that the long corridors are dominating and that there is a rather clear distinction between the corridor where she sits and the corridor on the other side. I interpret the different sides of the office as different *zones*, with a zone of service facilities in between the two corridors, which acts as a buffer between them. There are three main zones in the office – the rooms in Ann’s corridor, the rooms in the corridor on the other side of the office and the com-

mon zone with kitchen and conference room in between. The fourth and minor zone is the zone of service facilities such as toilets. Instead of uniting the different parts of the office, the middle zone reinforces the borders in the office. Ann describes it clearly as crossing an *edge*, walking over to the corridor on the other side. The edge is both functional and architectural in its character, according to Ann. It is a separate division of the company on the other side of the office and she seldom goes there since she does not work with them. She only sees them at coffee breaks.

There are no open spaces without walls in the office that hold the possibility of contributing to the common atmosphere of openness. There are two larger rooms on the other side of the office, opposite to Ann, that are used as open plan offices, but they are messy and do not contribute to the atmosphere of openness and light in the office. Ann says she lacks the possibility to see people come and go naturally without making an effort to see what is going on. When it is time for a coffee break someone walks around the office informing everyone about the break. This is done since the visibility from each office to the kitchen is limited.

There are no objects or targets in the office, which can be described as *landmarks*. When Ann is asked to describe the office in detail or to describe any specific feature or place

of importance, she cannot point out any. According to her all features blend into each other. The whole office is white – the walls, doors and window frames. She finds it hard to remember any materials used in the design. She finds it easier to describe what is lacking in the environment, but she says that she has gotten used to the environment by now. She likes her own room because she can decorate it as she likes.

There is no place that can be interpreted as a *node* in the office. Even though there is a common kitchen area and conference room neither of them act as a focus of action, which one could expect. The kitchen area functions as a meeting place only because people are called there for coffee breaks and there is no other place to go, according to Ann.

To summarize, the graphical illustration (Fig. 1) based on Ann's own story and mental map shows that her office holds two zones with major features, which are divided by clear edges and zones of weaker features. There are two paths with major identity along each of the major zones and a third major path connecting the two former paths. There are also paths of minor identity between the zones. However, since the office holds no nodes or landmarks there is, according to the analysis, no high degree of "imageability" at the office despite the strong features of the zones, borders and paths.

Cell-office in a large single room plan layout

Michael is in his sixties and he has been working at the same company for at least twenty years. The company moved into this new office building two years ago when it was decided that all the divisions within the company be gathered in the same office.

Michael has his own room in the economics department, which is situated in one of the wings of the building (see Figure 2). He describes his office as light and open, even though the office is a single room plan layout. He thinks it has to do with all the windows and the white walls and the use of light beech wood for windows and doors. He talks warmly about the artwork on the walls and feels there is an open atmosphere to the whole office. He likes to keep his door open and sit so that he can look out through the window to the corridor. He also likes it when people drop by to have a chat with him.

Michael describes the office as being clearly divided into different areas. These areas could be interpreted as *zones*. Despite there being rather clear zones in the office Michael does not hesitate to book conference rooms in the other zones if the one closest to him is occupied. The zones in the office are both architectural and functional, since the different divisions in the company are grouped together by their work in the different wings of the building. The wings extend like arms from the central point of the floor, i.e. the lounge area. The lounge area works as the main *node* in the office – all the main corridors come together here. People go there to have a coffee whenever they like or only to have a chat, as Michael explains it. Michael uses the word meeting point to describe the lounge area. He speaks vividly about the lounge and coffee area. It is perfectly situated, according to Michael, since it does not feel like it belongs to any specific division because of its placement. He likes the furniture – the sofas, which he finds inviting and the exclusive wooden tables and the desk by the coffee stand. According to Michael's description the coffee stand draws people to it and hence can be characterized as a *landmark*. It is an orientation target in the lounge area and its location is very important for its function, once again according to Michael's description.

The two staircase- and elevator zones can also be classified as *nodes*, according to Lynch's theory, since different corridors come together there and everyone has to cross either one of them to get into the office. They are natural meeting points – even though they are not as vivid as the lounge area and people tend not to stay there longer than necessary.

The different zones in the office are held together by the corridors, which I interpret as *paths*. The corridors spring out of the central node, the lounge area, and goes around in circles which cross each other. This layout provides employees with different options for reaching a single destination. This makes it stimulating to walk around the office since one can always choose a different path and the paths do not end in dead-ends. Michael often takes a walk along the different paths whenever he needs a break from work. There is only one corridor that ends in a dead end. Michael rarely walks there – since he does not find it inviting. He says that he feels like he is crossing a sharp *edge*, when he goes into this zone. He does not know the people in the corridor so

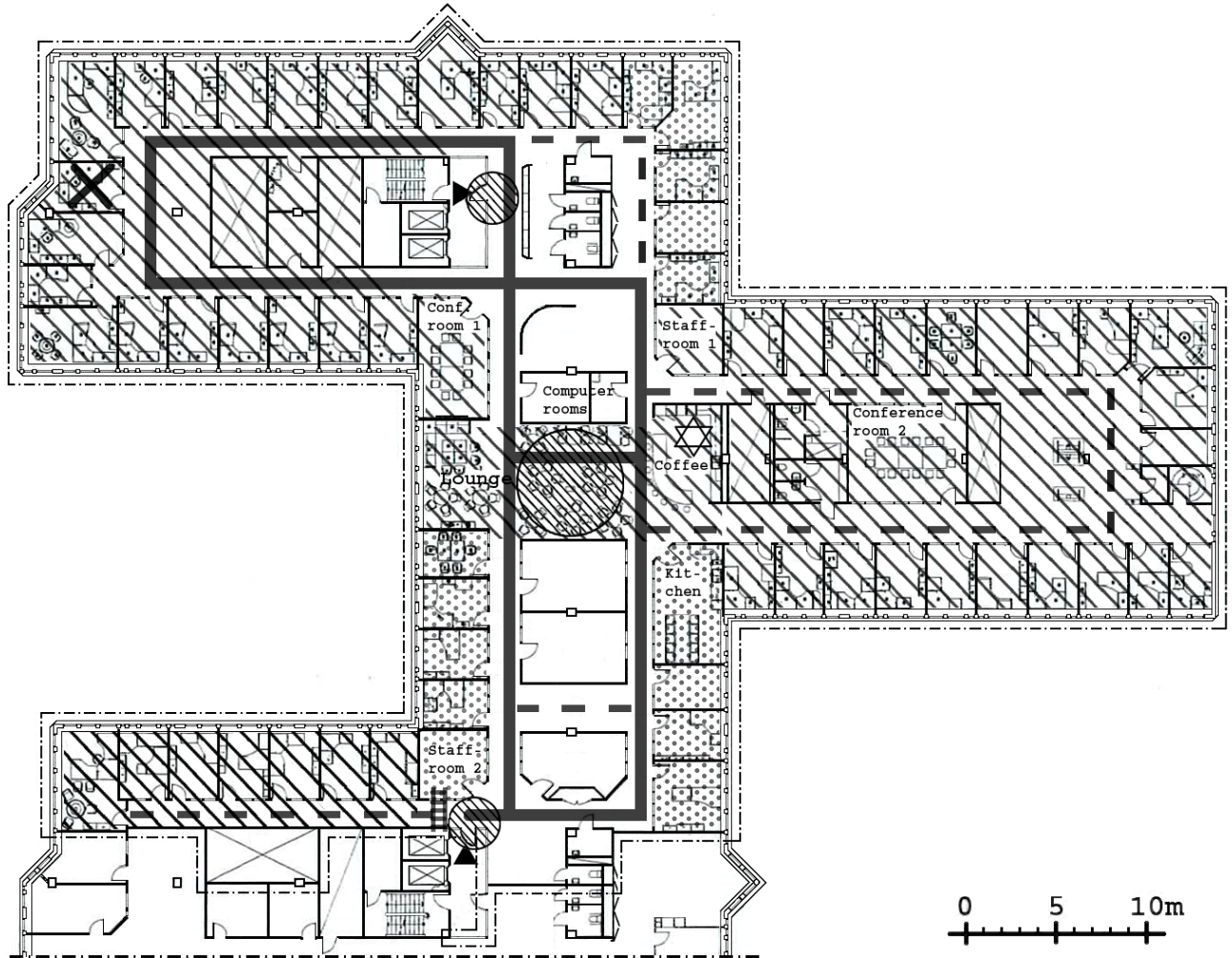


Figure 2. Cell-office in a single room plan layout

well, they are somewhat anonymous to him, and he thinks it has to do with the plan layout to some extent.

Altogether Michael has a very vivid image of his office and says he would not like to have it any differently, with the exception of possibly having some more colors on the walls. According to Michael the office combines the possibility to be social with the ability to seek isolation when necessary.

To summarize, the graphical illustration map (Fig. 2) based on Michael's own story and mental map shows that his office holds a higher degree of "imageability" than Ann's office. Michael's office holds all five elements that determine the degree of "imageability", according to Lynch. With

regard to zones, nodes and paths there are those of both major and minor features in the office. The result of the analysis indicates that there is a high degree of complexity and "imageability" at this office. On the basis of the graphical illustration Michael's office appears to be a better-designed office environment with a high degree of "imageability."

Flex-office in open plan layout

Lillian is in her mid-forties and she has been working at the company for decades. She has been at the office since it got its current design in the early 1990's. She holds no individual workstation at the office and she works from home occasionally. Even though she has no personal workstation

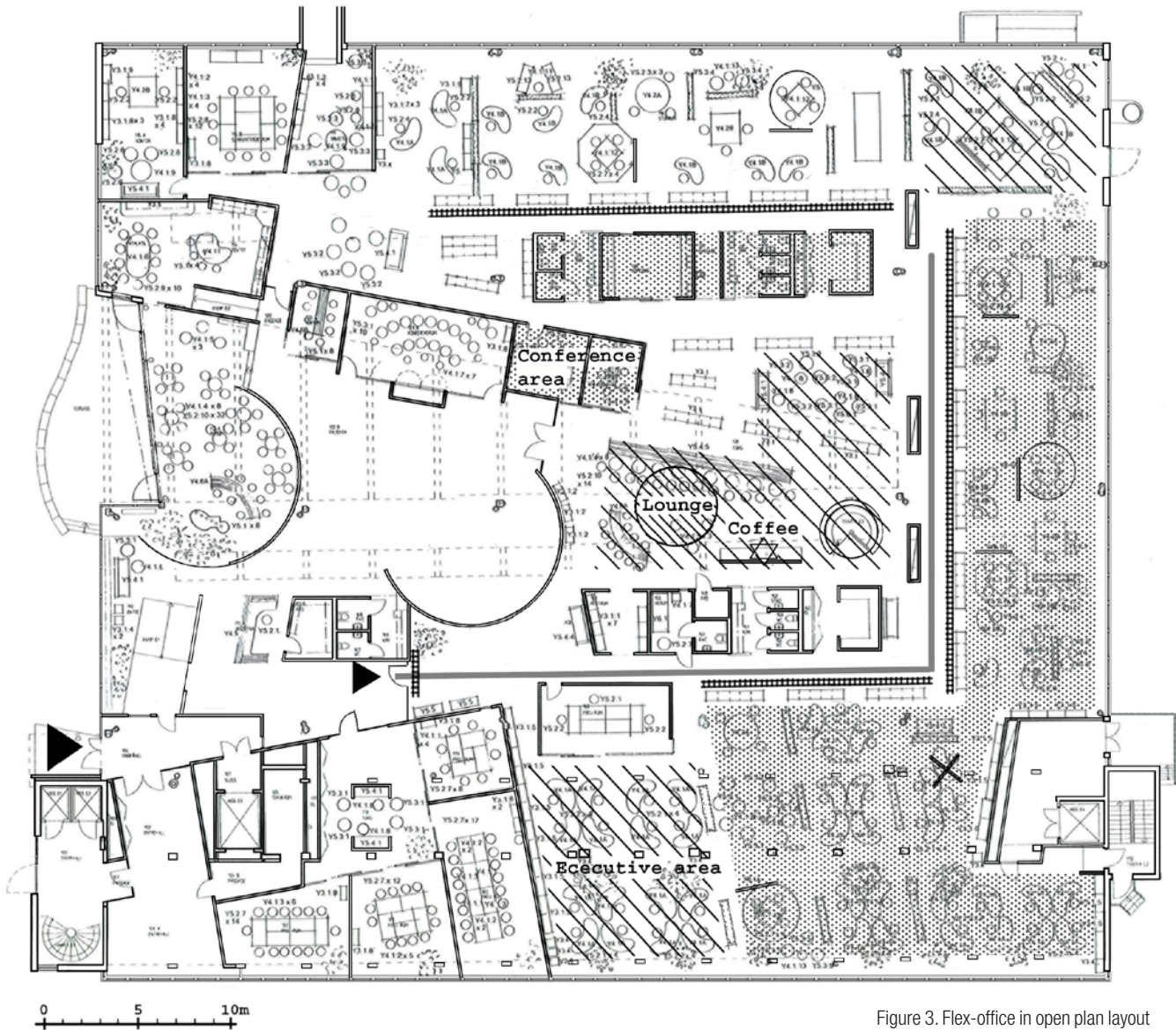


Figure 3. Flex-office in open plan layout

she has a favorite workstation she often chooses to work at (see Figure 3).

Lillian describes her office as one whole open space, but equally divided into zones. She feels free to sit almost anywhere in the office, except in the executive area since it is exclusively appointed to the management. She describes the *zones* as easily distinguishable since they are well defined. Every zone holds a different atmosphere depending upon the different natural light conditions, the furniture arrangements and the clear borders that separate the different

zones from each other. The distinctive borders could be read as *edges*. The distinctive edges between the working zones, social zones and the communication paths are defined by a clear division of function but also by physical objects such as plants and high cabinets.

The communication system does not consist of the traditional corridors in the office, but rather by *paths* that cross a more or less open space. Lillian describes it as being very obvious where to walk and where not to walk, despite the fact that there are no walls that make up the edges of the

paths. The main paths are more “public” in their characteristics; they are wider and have more distinctive edges.

The lounge area in the middle of the office is a major meeting point, which could be read as a *node* since it has a concentration of characteristics, a focus in which one can enter. This is re-enforced by the fact that it holds a significant atmosphere of relaxation and being away from the actual work. People gather in the lounge area because of its placement, its size and welcoming atmosphere. The fact that it is the major common zone and it holds a coffee stand, which works as a *landmark* for the whole office, reinforces its character as a node. All combined these factors contribute to its dignity in my opinion. Lillian describes the lounge area and coffee stand as very important for the whole office and for the relaxed atmosphere. It is also the first thing she describes when she is asked to describe her office. She vividly describes the material used in the office. According to her the office has a very home-like, welcoming atmosphere, something she attributes to the warm colors, the plants and the use of wooden materials.

To summarize, the degree of “imageability” at Lillian’s office is fairly high according to the graphical illustration (Fig. 3) based on Lillian’s own story and mental map. The office holds all five elements that are important for “imageability”. Its zones are of major as well as minor dignity. The lounge area in the middle of the office works as a major node and is combined with a landmark. The node, as well as the paths at the office, hold only major features. The degree of “imageability” is somewhat weaker in Lillian’s office compared with Michael’s office since it primarily exhibits elements of major features and thereby the environment holds less variation and complexity than Michael’s office. All together the office has a high degree of “imageability”.

Discussion and Conclusions

The analysis of the three different plan layouts shows that with the use of Lynch’s method it is possible to grade the level of “imageability” in different office environments. An environment that holds great “imageability” is characterized by the vivid image of the environment held by its inhabitants. Just like any evaluation of quality is normative in its characteristics (Rönn, 2003), so also is the evaluation of “imageability” thereby positive in its nature. Imageability is explained by Lynch as “that quality in a physical object

which gives it a high probability of evoking a strong image in any given observer. It is that shape, color, or arrangement which facilitates the making of vividly identified, powerfully structured, highly useful mental images of the environment” (Lynch, 1960, p. 9). One can of course always argue that intensively negative environments which evoke strong negative images also hold the quality of “imageability,” however according to Lynch’s definition of “imageability” they do not.

The three different offices show different degrees of “imageability”, which is shown in the graphical pictures. According to the results it is neither the scale of the office nor the actual office-type that determines the degree of “imageability” an office environment holds. Instead the analysis shows that the two cell-offices hold different degrees of “imageability” despite the fact that they are the same office-type. They are notably different in scale. This is however not the reason for the difference with regards to “imageability”, rated by the “vividness” in description and graphical presentation by the respondents. The hypothesis is that it is the quality of the plan layout combined with the quality of other architectonic features which determines the overall “imageability” of each office environment in accordance with Lynch’s theory.

The knowledge of “imageability” is not available by a plan layout analysis where functional and esthetical aspects are in focus. Lynch’s method of analysis shows what different users find important in their physical work environment and how they perceive and experience it. The method also has the advantage that these experiences are easily translated into a graphical diagram. The graphical diagram makes it easy for the user to express his/her opinion of an environment, but has also the advantage of easily translating into an architectural sketch of a plan layout. The method thus appeals to architects.

One must be aware that the picture obtained in an investigation like this is personal and based on a subjective perception and the use of a specific space by a single individual. To get the whole picture of how a specific office environment is perceived it is necessary to interview different people in the same office. In my opinion a plan layout analysis based on architectural design can never give the same profound information to the design process as this method. If staff are consulted as to how they actually per-

ceive and use their current environment before a move or a change of the office, many mistakes and bad solutions can be avoided in the design of the new environment. With Lynch's method it is possible to get a better understanding of where landmarks will appear and paths will develop, not from a functional analysis but by an analysis based on users' perceptions. In other words this method can provide guidance in how an architectural design will be received by its users in the end.

My intention was to investigate the possibility to use Lynch's method for analysis of urban environments in an office environment context. In my opinion the method not only helps to analyze the usefulness but it also determines the architectural quality of an environment from the user's perspective. It has the potential to be an efficient tool in the design process as well as a key to the knowledge held by daily users of an environment. The method has another advantage as well – it is easily combined with other methods for evaluating environments. What is important is that the evaluation is made by the users of an environment and not by researchers from the outside.



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It is a limitation that the study only analyses the office from an architectural point of view and does not include an organizational point of view. However, in this case the aim was to investigate the use of Lynch's model with respect to "imageability" of the office environment. For example an element such as "edge" can for example easily be interpreted out of organizational point of view and the organization has most likely an influence on the architectural perception of edges within an office environment. The fact that every individual holds different experiences and preferences has been perceived as more of a problem since it is hard to control for this in a qualitative study. One way to verify the result of this study could, however, be to see if the result correlates with a survey on health and well-being as well as job satisfaction among the employees in the same office environments. The next task within the research project is to conduct such a study. There is a possibility that an environment which rates high on "imageability" among its users also holds employees that are healthier and more satisfied with their jobs. The opposite may be true of office environments with low rates of "imageability" as well.

Notes

1. The open plan office is defined by the fact that employees share a common room with no walls between the workstations and there are no individual windows. They may have access to some individual equipment at the workstation.
2. Cell-office is the traditional single person room office. Rooms are arranged along the façade of the building offering every room access to a window; thereby long corridors that connect the different rooms to each other characterize the plan layout. The office work is characterized by its independent and highly concentrated work (Ahlin & Westlander, 1991; Duffy, 1999).

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