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Designing Inclusive Spaces

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Chapter X

Designing inclusive Spaces: Wayfinding in hospital complexes

Colfelt, Solvej

1.1 Introduction

In many parts of the western world communities intend to make large investments in healthcare. This development will create hospital complexes the size of small cities. Wayfinding in medium size hospitals, between 200-400 beds, is often already a big problem. A Lancet research article shows that an investigated American hospital of 300 beds has a yearly loss of 4500 staff-hours due to staff being disturbed in their primary functions by patients and visitors who have lost their way within the compound. Based on the average level of Danish wages this equals a sum of DKK 1.3 million.

Apart from being a costly side effect of the hospital environment, the problem of wayfinding is also a cause of stress among patients, visitors and the busy staff. A research project established in a Danish hospital laboratory to determine the causes of stress among the staff, concluded that one of the primary causes of stress among the laboratory staff was caused by frequent disturbances by patients unable to find their way out of the laboratory ! The proposed solution in the previous case is, as it often is in existing complexes, to improve the signage system. It is a big question how effectful these improvements will turn out to be. This article will explore the principle of wayshowing on the basis of prior research as well as on the basis of the results of three case studies in large existing Danish hospital complexe. The results point to signage being an inevitable factor but also that it is a factor that is not very effective, often incomprehensible and not able to stand alone as a wayfinding aid.

1.2. Research Project

This paper is part of a phd-project which is concerned with establishing which elements of the design of the built environment - building complexes - has an effect on wayfinding behaviour. There is a lack of research emphasizing the relation between architectural design and wayfinding a few articles can be found from the early 80'ies and 90'ies belonging to the introduction of the discipline of environmental psychology in some american universities. Recent research in wayfinding is primarily found in the domain of neurology or with relation to wayshowing. The phd-project investigates the fragmentary beginning of architectural wayfinding research and tests it against casestudies of three Danish hospitalcomplexes with different typology approaches. The following represents a focus on one of the elements, namely signage, on the basis of one of the casestudies- Hvidovre Hospital in the suburbs of Copenhagen.

1.3. Relation to accessibility issues and inclusive design.

The project takes part in a bigger attempt at the Architecture School of Aarhus, Denmark, to contribute through teaching and research in making the grounds for a public environment more accessible to all. Previous research at the school has primarily been concerned with design for disabilities. This project literally looks at accessibility for all and turns towards architectural typologies which to some degree are perceived to be inaccessible for all. Hospitalcomplexes have proven to be inaccessible to a lot of people regardless of age or disabilities though not unaffected by these factors. In most societies it is an accepted fact explained (or excused) by the complexity. Bu looking into the relation between the wayfindingproblem of hospitalcomplexes and design this project wants to question this acceptance. The philological origins of hospital indicates a place that welcomes all. Another question is if you're really welcome in a compound which is inaccessible to you because it is impossible to find your way around. This leads to the paradigm of what a hospital is or should be and if a shift of paradigm is what is needed to make hospitals accessible for all. A larger discussion which will not appear in this article.

2.1 Intertwined concepts of wayfinding and wayshowing

What is wayfinding and what is wayshowing? There seem to be no consensus when it comes to definitions of these terms. The concepts are intertwined and often confused. A clear example of that can be found when comparing internet dictionary definitions: "Wayfinding; signs, maps and other graphic and audible methods used to convey location and directions to travellers, also written as way-finding"

Another internet dictionary definition is: "Wayfinding encompasses all the ways in which people and animals orient themselves in a physical space and navigate from place to place". In past research in wayfinding in building complexes, it is likewise a concept with many definitions:

Joowon Ahn (2006):

- "Wayfinding is a cognitive process that involves recognition of a stable, comprehensive set of spatial relationships."

Ernst Kruijff (2000):

- "Wayfinding is the cognitive process of defining a path through an environment using and acquiring spatial knowledge helped by cues".

Carpman/Grant (1996):

- "Wayfinding is not the same as signage. Wayfinding refers to behaviour, while signage refers to one of the many design-related elements that can affect that behaviour."

Romedi Passini (1985):

- "Wayfinding defined in terms of spatial problem solving comprises three distinct processes: decision making, and elaboration of a plan of action, decision executing transforming the plan into overt behaviour and information processing which underlies both decision related processes".

Kevin Lynch (1960):

- Wayfinding = "a consistent use and organisation of definite sensory cues from the external environment".

The act of wayshowing in building complexes used to be undertaken by a combination of servicepersons at a reception, who would be the first to meet the visitor while entering the complex, and of signage (Arthur and Passini 1992). Signage can be graphic, textual or audible. Signage is a noun - a designed physical addition to the environment conveying information to passers-by. Wayshowing is the active act of giving information about the whereabouts of specific places. Wayfinding is a different category: It is a verb; a behaviour. Something that humans do to be able to get from one place to another. As stated in the above citation by Carpmann/Grant (1996) a whole array of design-related as well as natural elements can affect wayfinding-behaviour.

2.2. Hypothesis

The hypothesis is that the intertwining of the concepts of wayshowing and wayfinding leads to inadequate buildingcomplex design. Lack of awareness of all the known important designparameters and emphasis put on signage to solve wayfinding problems during a buildingcomplex project results in inaccessible buildingcomplexes.

3.1 Theoretical foundation of wayfinding

Wayfinding research is an object in many diverse sciences: psychology, neurology and navigation to name some. In design research the concept is introduced by Kevin Lynch. He proposes the following five parameters as constituting elements for finding your way within the urban landscape:

- 1)Edge
- 2)Node
- 3)Path
- 4)District
- 5)Landmark

His 50 years old book "The image of the city", remains the most thorough work which attempts to describe or examine in depth which design elements are engaged in human wayfinding.

Some 20 years later Jerry Weisman, on the basis of his own research combined with theoretical derivations, partly based on the theories of Kevin Lynch, suggests the following design parameters which are supposed to affect wayfinding in the interior of built environments:

- 1)Plan configuration
- 2)Signage
- 3)Visual access to landmarks within interior or exterior of complexes
- 4)Differentiation in interior lay-out

Weisman's own empirical research is primarily concerned with plan configuration and his proposal for the other factors; signage, landmarks and differentiation are theoretically derived hypotheses.

A thorough investigation of the design-related parameters of wayfinding is complicated by the dual or, as this paper suggests, possibly triple composition of the phenomena, consisting of:

- 1) the physical environment; the lay-out or design
- 2) the individual; intellectual capacity, emotional state, physical capacity (hearing, sight, movement)
- 3) "Aura" or Placelessness

4.1 Theoretical foundation of wayshowing

Signage is considered as being inevitable as a guiding device in building complexes. Together with plan configuration they are, according to Gunnar Gundersen (2009), usually the two factors taken into consideration in architectural praxis to secure accessibility and orientation in the design of building complexes. Research has been carried out in how signage works: This research investigates the required attributes of typography, contrast, size, positions according to eye-level and distances a.s.f. That is investigations in how signage works in direct relation to the viewer. In this article I will concentrate on how signage works in relation to users in the setting of a building complex. How signage affects the behaviour of users and not the particular effects of the constituents in a sign.

Mike O'Neill (1991) found that the fastest travel-rate was achieved in smaller less complex buildings with no signs, compared to bigger complexes with signs. Signs reduce the relative travel speed. Textual signs represent a bigger reduction in travel speed than graphic signs, whereas textual signs reduce the amount of backtracking. As suggested by a great master of signage Mollerup (2005) a building ideally explains itself. This is supported by the findings of O'Neill (1991). Despite this knowledge signage is a going mayor designfactor in creation of buildings as stated by Gunnar Gundersen (2009).

5.1 Methods

In order to investigate the relation between design and wayfinding in hospitalcomplexes three casestudies were conducted in three different large hospitalcomplex typologies. This article will report data collected during the study of Hvidovre Hospital in the suburbs of Copenhagen. Multiple methods were used to explore wayfinding behaviour, the wayshowing intentions and the actual setting of Hvidovre Hospital in order to recognize the wayfinding parametres in use and possibly establish a hierarchi among them.

5.1.1 Interviews

Employees and the principal architect were interviewed with regard to their intentions and experiences with wayfinding in the complex.

5.1.2 Photographic Registration

The main corridors of the hospital were registered. For ethical reasons no photos of patients or visitors were taken.

5.1.3 Observation of users

Wayfinding problems are already recognized in the hospital and a new signage system is currently under construction. Two-day observations of patients and visitors intended to find the nature of the problem and the related behaviour rather than demonstrating the frequency of the problem. The reports from these consequently consist in examples of behaviour.

6.1 Hvidovre Hospital

Hvidovre Hospital is a Danish hospital complex of approximately 600 beds taken into use in 1976. The project was undertaken by a Danish architectural firm, KHR, which won the contract in a public architectural competition. 46 bids were delivered most of which suggested a typology with a vertical patient ward-tower surrounded by lower buildings containing examination and treatment facilities. These were rejected by the judging committee as being inhuman. The inhumanity was perceived in the fact that the patients in these typologies were situated far above any direct visual access to greenery. The winning proposal was in four levels including a basement with parking spaces: the ground level contains treatment and examination and the two levels above contains patient wards. The lay out was of the simplest possible with two corridors, one at ground level and one at first level, that leads from the main entrance to the different treatment centers of the hospital.



Figure 6.1. Competition model Hvidovre Hospital 1963. Note plan simple configuration

When it was taken into use, the hospital had a special wayshowing system inspired by the Huddinge-Sjukhuset hospital in Stockholm. The designers and the building

committee had visited this facility during a study trip and they felt that the system would also be applicable at Hvidovre Hospital. The principle of this system, a kind of automatic ticket dispenser, was that at the entrance to the hospital in one of the four traffic centres, when accessing it from the underground car park, you pressed a button next to the name of the ward you want to visit. The dispenser then distributes a small map/ticket which indicates the shortest way of reaching the ward. The system did not work and it was dismantled 15-20 years ago.

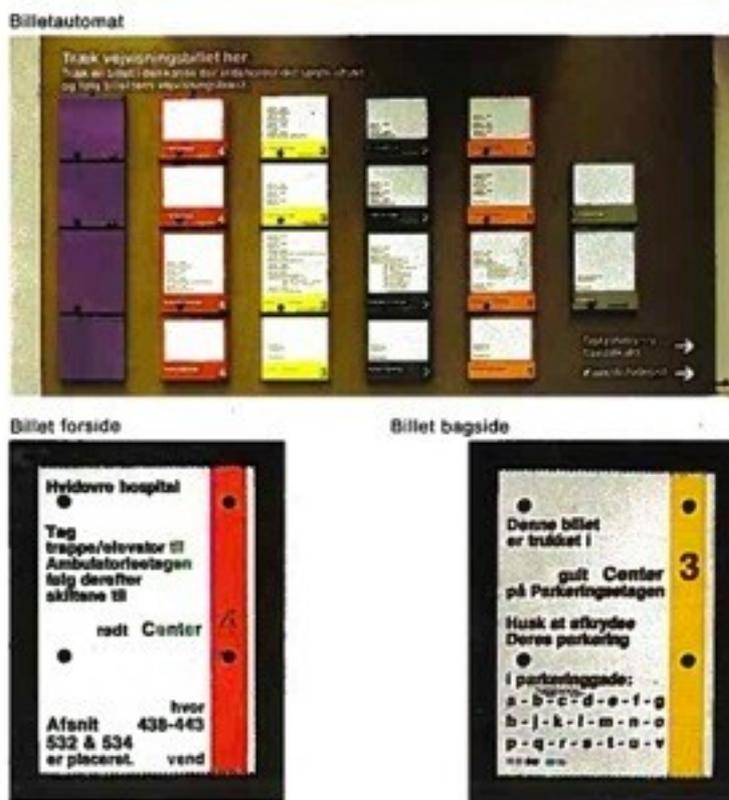


Figure 6.1.2. Ticket Dispenser at Hvidovre Hospital. Now dismantled

In addition to textual signs the wayshowing elements in the hospital includes numbering and signal colours. Each of the four pavilions/treatment centres has a specific number from 1 to 4 and a specific signal colour; orange, blue, yellow and red.



Figure 6.1.3. Signage and signalcolours at Hvidovre Hospital



Figure 6.1.4. Image from the primary corridor

6.1.2 Designparametres at use in Hvidovre Hospital

The collected data shows that all of the factors recognized by Weisman (1981) except one has been applied to the building design: Simple plan configuration, signage and artistical differentiation of the interior lay out. The only parametre missing in the primary corridor is visual access to the outside.

6.2 Examples of observed behaviour

Behaviour 1

Entering from the parkinglot-elevator X enters perpendicular to the main corridor. X stops, looks around with anxious eyes and fast movements. Turns to the big informationboard, gives it only a glance. Turns to a fellow user and asks for a particular roomnumber. Gets no positive answer. Returns to the informationboard. Runs to an adjacent door and enters. Returns back in two minutes and hastes back to the elevator.

Behaviour 2

Y comes walking from the main entrance which hosts the informationbooth. As soon as entering the main corridor Y gets an anxious look and lifts her arms. She turns to the nearest humanbeing and aks for the emergency departement. Y stands right beside a sign with an arrow pointing out the direction of the emergency department.



Figure 6.2.1. Sign pointing to emergency department

Behaviour 3

Z enters from the main entrance, walks calm and easy to a particular door and enters without returning back into the corridor. She clearly knows where to go.

7.1 Analysis and findings

Reactions of stress and anxiety tending to panic combined with hasty movements were common observations of wayfinding behaviour in patients and visitors in the ground level main corridor.

A simple plan configuration, heavy signage and differentiation in interior lay-out is also observed. Thereby 3 off the design parametres put forward by Jerry Weismann (1981) is fulfilled. Only one of the parametres is not in use; The design of visual access to landmarks in or outside the complex. Still observations show that feeling lost is a common feeling among the user. When it comes to signage the information board giving the broad overlook of the whole setting seem useless to the users. In general the observations point to signs rarely being used at Hvidovre Hospital and users seeking personal contact.

8.1 Discussion

The efforts undertaken by architects to make building complexes accessible and with good wayfinding attributes appear not to have a lot of impact. Regardless of heavy signage and easy planconfigurational layout users still find them selves lost and seeking for human aid. The studies of Hvidovre Hospital shows us that the application of the two factors acknowledged to be the most important ones; simple planconfiguration and signage is insufficient to make users feel secure and well oriented. Arthur and Passini (1992) suggest that in all mayor public building complexes the users should be met by a human being at a reception to be personally guided. The question is if in the increasing digitalisation of our environment the development of specific GPS's for building complexes like hospitals and educational institutions can substitute the observed need for personal contact ? The study of Hvidovre Hospital has led to the hypotheses that visual access to the outside and to landmarks outdoors is more important than signage as a wayfinding factor. This may have a connection to the kind of negative "sense of place" which is created by environments with no visual access to the outside. A creation of senses of mazes and prisons which implicates feelings of stress and anxiety.

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