Colour and wayfinding

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ABSTRACT
Colour can be a powerful navigation tool to help people find their way around a building. For effective wayfinding people should be able to relate spaces to one another and see the basic underlying organisational principle of a building layout. The use of landmarks as mental anchors, provide unique points in space, which can also be helpful in wayfinding [1]. Colour can contribute to the legibility of architectural spaces both with its application to emphasize prominent features of the layout and with its usage on landmarks. Due to its easy manipulation in a variety of design materials, colours become ideal design elements for creating environments that support user’s wayfinding abilities [2]. This paper looks into the question of how colour could help wayfinding in buildings and which colours would be useful for this purpose. The paper concentrates on architectural design elements, namely layout of buildings and landmarks. Together with literature review and recent research, this study discusses colour contribution to these architectural wayfinding elements.

Keywords: Colour, Wayfinding, Colour Schemes, Colour Coding, Landmarks.

1. INTRODUCTION
Wayfinding is the process of reaching a destination, whether in familiar or unfamiliar environments [3]. Wayfinding is a decision-making and problem solving process [1]. People need information to make the right decisions on a route so they find their way to a desired destination.

Colours in an environment work as communication tools between people and the objects or surfaces surrounding them [4]. It plays a significant role during encoding and recognition processes and also helps to improve visual memory of images in building environments [5]. Therefore, colours should be used to give the right message to people through the built environment [6].

The aim of this paper is to identify how colour can aid wayfinding and which colours would be beneficial for this
purpose. The method of the study comprises of studying the available literature on wayfinding strategies to find out possible useful locations for applications of colour and of incorporating author’s research work on the issue.

2. WAYFINDING STRATEGIES AND POSSIBLE COLOUR APPLICATIONS

People need to know where they actually are in complex environments to feel themselves secure and safe. The difficulty of navigating in buildings suggests the need to support navigation with design elements. These design elements can either be architectural or informational. Informational design elements are anything from signage to digital information displays. Architectural design elements are the layout of a building and landmarks within.

2.1 The layout

Layout of a building is one of the sources of information for finding one’s way in the built environment [7]. The layout of a setting could be defined by its spatial content, form, organisation and circulation system [8]. A layout that is legible consists of a building or groups of buildings facilitating the ability of users to find their way around [9]. People usually cannot adapt well to large amount of variations in a building. Clearly identified and grouped spatial content aids wayfinding. In terms of form, buildings that are organised around a simple orthogonal grid with regular angles seem less problematic than irregular designs. For organisation, symmetry axes, elongation and use of visible structures (e.g. atriums) all provide comprehensible environments. It is essential for users to have a clear line of sight for circulation systems, as it is easier to find a destination that one can see [10]. The monotonity of architectural composition and the lack of reference points increase wayfinding difficulties where visual access to main destinations makes wayfinding facilities easier [11]. Regular layouts with simple corridor systems also allow easy orientation.

Colour contribution: Colour can contribute to comprehensible layout design with changing degrees. A major contribution can be with a strategically colour scheme applied to the whole layout of the building. This may be applied by architects and interior designers with a selection of colour schemes that enhance the layout of the building. In this integrated form of colour application, colour becomes just another design tool reinforcing form and ambience, and cannot become a separated information cue readily available for the users.

An attempt to make colour more obvious and over-riding can be done through zoning with colour-coding. Zoning tries to simplify the layout into wings or blocks in order to differentiate between areas and departments in a building. Zoning done by defining an area or section of the building with colour is done with colour-coding. This kind of application is usually executed by colouring the walls or floors of different areas in different colours or using coded colours in door frames or cornices. People in colour-coded environments make fewer errors in wayfinding tasks [12]. They more accurately locate specific targets in the building and have higher recall and recognition memory for floor plans of the building [12]. The difficulty with this approach is that it may not even be recognised by many users of the applied environments. Two out of three people at health-care sites that have a colour coding system did not notice the colour coding [13]. Colour can be best used for simple zoning of no more than four spaces of a building [14]. Colour coding should be easy to comprehend and should not exceed more than a few colours. These few colours should only be applied to parts of the building already distinguishable by its form. By this way, colour can serve as a reminder for
locating already distinct parts of the building with its relation to its immediate surroundings. E.g. “I am now in the red building which faces the train station I used to arrive here.” A more successful way to code with colour is to limit the usage, for example, to only one wall of a corridor. Colour coding the boundaries on the floor was also found beneficial in a hospital [14]. In either case, colour usage should not dominate the environment. It is a tool and it should not override the visual environment.

2.2 Landmarks

Landmarks are point-references in an environment, which give strong association to a particular space in a building. Landmarks need to be located strategically so they could be perceived from as many directions as possible [15]. Landmarks help people to navigate easier and to better understand the building [16]. Landmarks become successful not only by the quality of the object itself, but also with how well a user associates that landmark with a specific space. Landmarks can be utilised by users in making directional decisions and in recognising something familiar on the route undertaken [17]. Landmarks can be used when giving route instructions or making mental representations of a space [18]. Cause landmarks are easy to recall and recognize and user can talk about them. Indoor landmarks can be architectural peculiarities, pieces of art or just technical installations [19]. When people are finding their ways, they use landmarks to provide scenes to be marked as anchors for spatial relationships. People in environments with landmarks acquire better spatial knowledge and direction sense [20].

**Colour contribution:** A landmark needs to act as a visual attraction point. Visual attraction can be provided with visibility, shape, colour, texture, markings and size [18,21]. Locating the landmarks in decision points where users need to make decisions on their desired direction is very important. Objects at decision points tend to be recognised faster than objects placed at non-decision points [22]. As visibility depends very much on the colour difference between the object and its background or immediate surroundings, colour can be effectively used to enhance landmarks for ease of wayfinding.

One important question can be whether or not there are any advantageous colour pairs (object and background) for attracting attention. In studies with isolated colours, red was suspected to be the hue attracting the most attention [23, 24, 25, and 26]. In an outdoor study, each colour was judged to be closer than it’s nearest matching grey, but there was no difference in advancement for one hue over another [27]. In a study where foreground-background colour combinations were judged in terms of attention, no hue was differentiated as attracting more attention on a specific background [28]. When the participants continued to see the images, they judged that cyan attracted attention on red and yellow backgrounds, while red attracted attention on cyan and blue backgrounds [28]. As the latter judgment required more exposure to colour combinations, it can be assumed that the hue component of a colour is secondary to the brightness-saturation component of a colour for attracting attention.

Structuring of space through colouring helps children at school age and adults in the same manner to find their way around [29]. A recent study with seven-eight years old school children found out that coloured boxes located as landmarks had a significant effect on finding their way, while no significant difference was found between different hues [30, 31]. The same study also found out that children remembered the location of the first and the second colours on
their way more accurately than the other colours. This study also suggests that colour used as landmarks on decision points would contribute to wayfinding. In terms of memorability, the first and the second colours on the route were remembered, suggesting a careful and limited usage of number and location of colours.

3. CONCLUSION
Colour works as an environmental information tool for user's successful wayfinding abilities [2]. It can be used as a visual cue to help individual's focus on a particular area of the built structure. In buildings, colour can be used to break the monotony and different spaces can be enhanced with their colour scheme. This way, colour can help cognitive mapping by marking varying ambiances of different spaces in a building. Colour-coding should be carefully applied and colours should be sparsely used. Colour should not override the overall atmosphere, but instead should be a part of the overall ambience. When landmarks are concerned, colour can help visibility of those. Colour can also help associating a space with a particular landmark. It should be noted that memorability of colour is limited to only first and second landmarks or prominent colours seen, so it is best to make only one or two colours dominant for wayfinding purposes. Lastly, it is important to always remember that colour is all about materials, as all materials come with a particular colour choice.

REFERENCES