Analysis and study of the color and shape of the walls in the legibility and perception of urban landscape

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Abstract
The facades and walls of buildings and structures are one of the most essential aspects of the street that contribute to its legibility. The task of the facade is to improve the quality of the space around it in terms of character and personality, landscape, legibility, beauty, and things like that. Therefore, it is necessary to pay attention to the quality of legibility and desirability of the street and ease of mental perception. Discussion about the form of buildings and spaces in the urban landscape and the study of color interactions on it plays a significant role in increasing the quality of the environment. Color and its permanent companion, light, and achieving the relationship of the use of colors for particular elements can be useful for creating a strong link between the past and the present and, as a result, cultural continuity. On the other hand, achieving goals such as visual beauty, spatial harmony, positive environmental and psychological impact, the need to study the color element in urban space is essential, which is a tool for expressing human emotions and reflects different cultures. The interview of this research was taken from a group project that was about the citizens’ mental perception of modern and old views in the fall of 2019. Then, in this research, the combination of this concept with the colors used in old and modern facades and the analysis of the color combinations of the facades and how they relate to each other has been discussed. The results show that the use of indigenous materials in the facade, which is in terms of color in accordance with the climate and culture of the region and its combination with the form and bodies that have the principles of facade and form diversity increases the Legibility of the environment and mental retention in citizens, as we see in the old views, but unfortunately, the modern facades, due to the lack of attention to these concepts, cannot be legible and mental permanence, and convey a kind of meaninglessness to the citizens.

1. Introduction

The facades and walls of buildings and structures are one of the most significant elements of the street that contribute to its legibility. The task of the facade is to improve the quality of the space around it in terms of character and personality, landscape, legibility, beauty, and things like that. Therefore, it is necessary to pay attention to the quality of legibility and achieve its basic components in defining and desirability of streets as much as possible and ease in clear mental perception for citizens and audiences. and things like that. Jedi (2016) [1] When it comes to the urban perspective, what comes to mind from today’s cities is an amalgam of designs, colors, and forms that have immersed ugliness and abnormality in the eyes and minds of citizens without any deep content. Yousefi (2010) [2] In the past, city buildings were not only designed individually, beautifully and accordance with the principles of visual aesthetics, but also built with respect for the surroundings and the urban environment. Haghgoo and Mulla Salahi (2010) [3] Following the importance of public areas and the value of urban life in recent years, the facade has regained prominence. The facade of each building is effective in the urban complex in which it is present and has this effect on the body of the streets and squares where they are located. Yousefi (2010) [2]

Building design is one of the architectural components that influences the construction of a city’s or urban space’s image. Parts of the structure, such as the roof and facade, play a significant role in generating the legibility and imageability of the historical core in densely populated places. Nurgandarum and Anjani (2020) [4] Color studies are one of the themes of interest in the field of historical urban landscape studies, which shows the awareness of our ancestors of the psychological and aesthetic effects of colors. Tadayon et al. (2018) [5]

2. Literature review:

2.1. Legibility

Legibility allows for an urban space to be understood and memorized(Lynch, 1960). It is also related to navigation (Weisman, 1981). Syed Mahdizar and Safari (2014) [6] The legibility degree of a space will determine the level of sharpness space imageability. In context of the legibility degree of a space, visual communication is one of the important principles in designing the architecture of the city. Without legibility, the meaning of a place can be misinterpreted or ignored entirely. The way people perceive, read and understand the environment is related to the regularity of the urban space. Perceptual regularity becomes the basis for legibility or easier to identify and organize the parts into a coherent pattern. Nurgandarum and Anjani (2020) [4]

Kevin Lynch’s (1960) concept of legibility is used to operationalise the landscape image. Lynch (1960, pp. 2–3) defines the legibility of the cityscape as “the ease with which its parts can be recognised and can be organised into a coherent pattern”, reflecting his concern with the
The importance of this art. In fact, individuals begin their lives by walking. 

In this regard, the urban landscape is a concrete phenomenon that and our perceived space of the existing reality of the city around us. The urban landscape is all available information from space that can be received by the senses and nervous fibres acquire environmental data (output stimuli) and convey it to the brain. Analyzing and interpreting information received from the environment in the brain is the next step that leads to perception and then, cognition of the environment; Thus, “feeling the environment” is the basis of “perceiving and knowing the environment”. Shahcheraghi and Bandar Abad (2015) [9]

The first step of a human in communicating with their environment is to feel that environment. Human sensory organs and nervous fibres acquire environmental data (output stimuli) and convey it to the brain. Analyzing and interpreting information received from the environment in the brain is the next step that leads to perception and then, cognition of the environment; Thus, “feeling the environment” is the basis of “perceiving and knowing the environment”. Shahcheraghi and Bandar Abad (2015) [9]

Perception is primarily visual and visual perception is primarily spatial. By moving in space, we experience the world around us in the form of a sequence of visual stimuli, and we understand spaces, environments, and surrounding landscapes with all their various dimensions. In fact, ‘our sensory perception of a place is to a large extent a visual and more precisely spatial perception’. Motahhari Rad (2016) [10]

2.2. Perception

Perception is a process placed in the center of any environmental behavior because the source for any data is environmental. Environments intrigue all the feelings and face the person with information more than human’s capability to process. Therefore, perception isn’t something like feeling, but is as the result of process filtration by the person. Perception is also the exchange between speed and precision. Speed and precision are suitable goals in intellectual process. Our mental representation make this exchange easier by quick recognition of things seem to be possible, despite sensory or visual pattern changes. Tavassolian and Nazari (2015) [8]

The concepts of light and color are extremely closely related in Iranian art; due to Iran’s geographical location and proper use of sunshine, Iranians employed many strategies to direct light to areas and manage sunlight. Eghbali (1999) argues that Iranians used color in a very artistic way, both inside and outside the structure, and that they avoided any color waste. The use of colors due to accurate knowledge of its properties and familiarity with the symbolic properties of color, not only in terms of decoration but also served to create coherence and visual continuity. Tadayon and Ahmadi (2016) [13]

2.3. Urban Landscape

The urban landscape is all available information from space that can be received by the senses and processed in the process of perception. Information such as form, function, and meaning of space. It is a feature of the city's shape that the spectator notices. In other words, the shape of the city in the urban landscape layer becomes a directly tangible quality, that is, the city landscape is perceptible objectivity and our perceived space of the existing reality of the city around us. Rasouli and Rahim Dohkt Khoram (2009) [11]

In this regard, the urban landscape is a concrete phenomenon that existed due to the quality of the physical factors of the environment. However, it develops a mental image as a result of being placed in historical contexts against individuals who perceive it, and therefore it becomes a sociable linking element. Mahjoob Jalali and Massoud (2015) [12] if we consider the urban landscape to be a form of art, the wide range of its audience and creators will be a testament to the importance of this art. In fact, individuals begin their lives by walking through galleries known as streets, which serve as a kind of perpetual exhibition of urban landscapes. Such contact with works of art reveals the important role of the urban landscape in promoting artistic culture and promoting the aesthetic taste of citizens. Tadayon and Ahmadi (2016) [13]

2.4. Color in urban Landscape

Colors are one of the components that determine the visual quality, attractiveness, and Legibility of urban space, and their proper application in a city contributes to beautifying and softening of people’s spirits in busy cities, as well as giving the city a pleasant feel. Molanaie (2017) [14]

The color of the urban landscape includes natural landscape color, building color, liquid transit color, pedestrian attire, and so on. The color scheme with a lot of variety. Different colors stimulate a person's mind in different ways. Color can cause a person to experience changes in temperature, dilemmas, excitement and tranquility, Lenovo and symbols, expansion and contraction. Xueping and Shicheng (2012) [15]

In the city, and the environmental observer's perceptions of the urban landscape as a camera (That is, depending on the point of view she or he has in front of each sequence's scenes and volumes) One of the most important factors that is faced perceptually and visually and with regard to the qualities of diversity, Legibility and environmental coherence; Is a variable called color. Zare and Lotfi (2017) [16]

Table 1. Application of color in urban space [17] [18].

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<th>Color in the Urban Landscape</th>
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| Creating identity and determining the landscape are the two most important goals in urban design, and color may be a valuable asset in both cases. Given the environmental qualities of cities, the proper use of color can play a significant part in the city's identity. In the past, each city had its own color that reflected its identity; however, in today's world, the colorful canvas of the city leads to such a chaotic situation that causes visual disturbance in urban spaces, so on peace of mind and it negatively affects the psychological well-being of citizens.

The effects of color on the diversity and vitality of urban spaces |

Because a pleasant environment is beneficial to citizens' mental health. Therefore, colors can play a major role in creating a diverse and happy environment. For example, on commercial streets and children's playgrounds, a variety of colors have been used to create happy and cheerful spaces. Even special occasions throughout the year have a
The effect of color on human perception of the environment. One of the easiest ways to restore peace to human beings is to use harmonious colors, especially in the field of urban beautification, and giving it a distinct look. Color is one of the most important elements that can easily and at the lowest cost help define spaces to create legibility and a sense of unity and a sense of place. In addition, color identification can help make the space legible for city planners.

2.5. Form of walls in urban landscape

The building's walls are made up of elements that designers can mold and combine to generate the desired facade by identifying and comprehending these parts. These elements include: entrances, windows, terraces, roof trailing edge (skyline), the main chamber building (areas including the aforementioned elements), volumes come out and you're gone. A professional organization focuses on the exteriors of buildings and the urban environment, including color, size, appropriate materials, full and empty spaces, facades, and harmony principles. Aboutaleb et al. (2016) [19]

Forms have psychological consequences, and they can be used to send the desired information. Therefore, the form should be chosen in a way that is in harmony with the content of the space. In general, curved lines inspire a sense of calm and tenderness in the human mind, and oblique lines evoke a sense of dynamism and endeavor, and sometimes violence, so their lines and mood can be effective in designing different spaces, which depends on the type of space and its efficiency. Torkzadeh Mahani and Ghaemi (2017) [20]

Facade and architecture the variety of buildings, the matching of colors and materials, draws the point of view to the details and creates a rhythmic and diverse atmosphere. Gharib (2012) [21] As evident in Frewald's (1989) study, the older buildings that had a diversity of physical features were rated high in visual richness, or complexity. Cheuk Fan (2020) [22]

3. Method

The descriptive-analytical research method was used in this study. Data were collected at the library and in the field via observation, interviewing, and photographing samples.

To check Legibility and comprehension, interviewees were asked to explain what they remember along the way and why they remain in their minds, and also questions were asked about new and old views in the area. Then we examined the desired views and obtained their color analysis through Photoshop.

The goal of this research is to look at how the forms and colors utilized on the walls affect the environment's Legibility and people's perspective.

4. Site survey

The views studied in this research are from the central part of Tabriz. To do this, we chose two routes from the central part of the city, which have both new and old facade Fig. 1 This part has valuable historical views, but today, due to neglect and lack of care, they have become worn-out urban walls. Therefore, government agencies have started demolishing and constructing new buildings with modern facades.

4.1. Analysis of color and shape of walls (Ferdosi st)

According to the interviewers, valuable walls, such as the walls of inns in Figures 1 and 2, have harmony and rhythm next to each other, and the type of brickwork of the structure has a high historical significance in their opinion. And, along with the restoration of their use, they must be conserved and rehabilitated Fig. 2, 3, 4.
4.2. Analysis of color and shape of walls (Emam st)

When answering most of the interviewees, they referred to the municipal building Figure 3. In their opinion, the type of materials and proportions of the municipal building has a special beauty Fig. 5, 6.

According to the interviewees, the dimensions of the Kaboud Mosque with its special architecture and historical appearance attracted more attention. The Museum of Azerbaijan, which is located next to Khaghani Park, has a huge dimension in the minds of the people.

Khaghani Park with its green space remains as the third element in the minds of the interviewees. The dimensions of this building and the details that are engraved with bricks and stones have been the reason for the attention of observers Fig. 7, 8.
Some of the interviewees were not very satisfied with the uniform walls of the square, and the Abrisham Tower was not mentioned in the square despite its large scale. One of the notable points of the square for the interviewees was the square carpet design, the color combinations of which aroused their curiosity Fig. 9, 10, 11.

According to studies conducted in old facades, the unique combination of body shape with color has had the greatest impact on the minds of citizens. The use of local materials in these facades, which are in accordance with the color spectrum of the region of Azerbaijan in terms of color, and the details done in the bodies, have
created shadows and light and made the facades more visible. But the new facades have received less attention due to having only one color spectrum, regardless of the details of the form and body, and are not as lasting in the mind as they should be.

5. Conclusion

According to the surveys, the new facades are unable to stay in people's thoughts due to a lack of variation in the skyline and a lack of attention to the facade's details and color combination. The use of local materials that are compatible with the climate of the region in terms of color, as seen in the historical facades of the city, and attention to the use of color combinations with details and principles of building facade will increase the Legibility of a place and its durability in the eyes of citizens. Therefore, it should be noted that the facade is not only a cover for the city walls but also reflects the identity of a city and its culture. Where people feel belonging to their environment and find it Legible. Paying attention to all this causes people to feel a sense of responsibility towards their environment and pay more attention to it.

Declaration of Conflict of Interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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