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THE ROLE OF GRAPHIC DESIGN IN BUILDING THE "WAYFINDING" SYSTEMS

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ABSTRACT

The "Wayfinding" is the process of organizing and communicating our dynamic relationship with the space and environment. The successful graphic design, which enhances "the Wayfinding" permits the persons to identify their locations within a specified framework and identify their destination and developing a plan that would pave the way to guide them from their location to their destination. The design of "Wayfinding" system must include the following: Identification of spaces and labeling them, classification of spaces into groups, connection and organization of spaces through both the architectural and graphic instruments. The human being during his exploration activity extracts information from the environment, store them, process them, and recall them if necessary. The effectiveness of "Wayfinding", which is based on three distinctive performances, includes the following: Decision-making, execution of decision and processing of information. This practice represents the ability to solve the spatial problem, which deems necessary every day because almost everyone needs to find his way to new location, such as classroom or store or school. [Passini, 1995].

KEYWORDS: Graphic design, "Wayfinding", Build environment, Navigation path, Maps, Directions, Symbols, Landmarks, Orientation, Navigation.

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1. INTRODUCTION

The navigation from a place to another is basic human activity and an integral part of daily life. People use their previous knowledge and expertise to find their way in the build environment, but the human cognition of build environment and information in the space may lack balance and concentration without external assistance afforded for orientation and navigation. The "Wayfinding" acquires particular significance in complex environments such as urban centers, healthcare, university campuses, and transport facilities. When architectural environments become more complicated, people need visual signals such as maps, directions, and symbols to assist to guide them to their destinations. Very often, in these high-tension environments, the effective "Wayfinding" systems contribute to have feeling of comfort, safety, and security.

In rural areas, the "Wayfinding" specialists develop the signage and information systems for the pedestrians and drivers of vehicles who encounter unique challenges in their navigation between the streets and roads. These information systems assist people to develop their mental maps of the areas and simplify the roads as much as possible. [Peterson 1998].

2. THE DEFINITION OF WAYFINDING:

The "Wayfinding" represents person's ability to identify his location, approach the intended destinations, and navigate into spatial environments in terms of cognition and behavior. [Passini, 1984a; Rovine and Weisman, 1989].

Oxford Dictionary defines the "Wayfinding" as the process to check person's location; it is the activity done by the person to check his location as well as planning and following of road or path [Oxford living Dictionaries].

Therefore, "Wayfinding" refers to information systems, which guide people through the material environment and enhance their expertise and understanding of space.

The "Wayfinding" systems depend on environmental information [Dogu and Erkip, 2000] that are received from the environment during the activity to identify path, either architectural or graphic needed to solve the spatial problem. [Passini et al., 1998]:

Firstly: Architectural Wayfinding Systems:

There are five basic architectural elements for Wayfinding such as: (1) paths/circulation, (2) markers, (3) nodes, (4) edges, (5) zones/districts, along with visual accessibility capabilities, which represent design standards for rural environment that are overexplicit and understandable.

Architectural Wayfinding Systems target the design and planning of landscapes, rural facilities and buildings as spatial indicators.

Secondly: Graphic Wayfinding Systems:

There are four main graphic categories, which represent the elements of Wayfinding design:

(1) Orientation.
(2) Directional information.
(3) Destination identification.
(4) Situation and object identification.

The Graphic Information is the most direct way for people aiming to find their location. The model graphic Wayfinding information include systems consisted of texts, symbols, maps, pictures, models and charts, thus the visitors are required to watch, read, learn and understand these systems while passing through a site or inside a building. [O'Neill, 1991a].

The researcher will proceed to study graphic Wayfinding systems in particular.

3. WAYFINDING BASICS:

The Wayfinding plays role to inform people about the surrounding areas in uncommon built environment. It is important to display information into strategic points in order to guide people in the correct directions. The buildings that had complicated environments are interpreted and stored by the human memory, whereas the general structure of environment necessarily affects the structure of cognition and memory, otherwise, the stored knowledge will be rarely used for navigation purpose and other models of orientation behavior. [Passini, 1996].

The effective "Wayfinding" system depends on the human behavior and it is consisted of the following characteristics:

- Time saving and thoughtlessness by establishing comprehensive, clear, and consistent visual communication system with briefed messages.
- Presenting only what is necessary of relevant information to the space, location, and/or navigation path.
- The elimination of excessive information, this means removing unnecessary elements in order to create completely clear visual environment. [Dogu and Erkip, 2000] as shown in Figure (1).



Figure 1: Partial model of Vienna Subway map, which only shows the essential information needed by the travelers for navigation.
https://www.smashingmagazine.com/underground-signs/

4. WAYFINDING CRITERION:

This group of principles is based on making information spaces effectively navigable. Navigability means that the navigator can successfully navigate through information space from his current location to another destination, even if the destination's location is known, but not precise.

There are three criterions which determine the possibility of navigation in space

Firstly: Whether the explorer would be able to explore or infer his current location. Secondly: Whether route/path targeting the destination can be found. Thirdly: The extent thru which the navigator would be able to build up the expertise in "Wayfinding" within the space. [Kitchin, 1994b].

First Criterion:

The successful recovery of location and orientation, and whether the navigator is able to answer these questions decisively: "Where I am?" and "which direction I am facing?" The answer to these questions can be verbally, for example, I am in

Lobby no. 7 facing Massachusetts Avenue3 or in writing by drawing an arrow on map of the environs.

Second Criterion:

It is the ability to successfully execute the tasks of "Wayfinding". The successful way passing process occurs when the navigator is able to make correct navigation decisions that take him from his current location to destination in a way that would achieve his main goal. Examples of such decisions involve whether to continue along the current path or retreat, or what is the action that can be taken at path intersections, or whether he will stop and collect information from the environment

aiming to confirm the current way. Arthur and Passini define the "Wayfinding" term as finding solution for the spatial problem. [Arthur and Passini, 1992], whereas the navigator finds satisfactory solution for bigger task through navigation.

Third Criterion:

It is the extent thru which the navigator can build up "Wayfinding" expertise in the space. The ability to imagine the wide space represents the capability of navigator to form consistent mental image or map of this space. Kevin Lynch, who is urban planner, verifies first as how the urban space characteristics would affect the extent thru which people remember the features therein. [Lynch, 1960]. "Lynch"met the inhabitants of Boston, Los Angeles and Jersey City at New Jersey State and asked them to draw planning maps of their city in light of their memory. In virtue of these planning maps and verbal interviews, "Lynch" compared the imagination of cities: The extent of quality of planning maps and interviews and did they reflect the actual planning of each city? "Lynch" found that the respondents organized the photos of their cities by using a group of common features: paths, landmarks, regions, edges, barriers, nodes and intersections.

What makes the findings of "Lynch" particularly interesting is that the imagined features that do not forget the area are used by persons to assist them in

"Wayfinding"; whereas the landmarks are locations which are memorable to afford assistance to guide the navigator. The regions are distinguished places that put him in one part of environment and

the nodes determine the points of passing decisions making. Due to the fact that the navigator uses these features to record his previous expertise in following the way, the designed area used by navigators must maximize the effectiveness of easy navigation.

There are two final criterions: wayfinding ability and wayfinding image ability. These criterions had special relation with information spaces. The way information/wayfinding is displayed in information space must be compatible with information seeking behavior in information access environment. Passing the test successfully means that the user is able to use the information access environment to meet his information requirements. In navigable information space, the problem of loss in the hyperspace can be solved. [Edwards and Hardman, 1993].

In imaginable space, each successful navigation cycle can contribute to build consistent mental image of information environment and contents therein. Ideally, the user becomes more effective to meet his information requirements each time he navigates through the environment. In information space planned on principle relevant to user's task, the mental map is compatible with the conceptual content map, which reflects the significant relationships between information and basics used to plan it.

5. WORK PLAN OF GRAPHIC "WAYFINDING" SYSTEMS:

How do people determine their destinations? How do they navigate? How do they recall the build environment? And why do people recognize or understand certain place more than other place? As shown in the pictures on the left side, there is geographic map versus cognitive (mental) map. This means the reality versus human mental memory. Figure (2).



Figure 2: Geographic map versus mental map.
http://designworkplan.com/author/admin/page/2

When wayfinding design is created, the following characteristics affect the way regarding the interpretation of build environment:

- Landmarks

In order to create legible environment, it is necessary to mark specific spaces and/or locations. This practice enhances the recognition of places and plays role to monitor larger area. Using Landmarks together with marking elements would make the area more clear and would have optimum understanding in the human memory. The Landmarks can be Art Objects, Famous Buildings, Street Art, Wayfinding signs or noticeable elements in the general planning of city or quarter. These collective elements will form the identity of unknown area from individuals' perspective. [Golledge, 1991].

- Orientation

For navigation, person needs to know where he is in the build environment and where the other destinations are located. It would be useful and preferable to know the distance by time from one place to another. If person is capable to guide himself inside build environment, then it is easy to recognize the directions and navigation through landmarks.

In wayfinding, the maps are normally used to indicate your location. Using the maps is a very strong instrument to express the build environment and monitor it. The display of maps must be ensured commensurately in the direction the person is facing. By this way, person will be easily capable to connect himself with build environment. [Kaplan, S. 1983].

- Navigation

In material reference, it means navigation to specific area in terms of preparation and destination. Through the use of fixed directional signs, people are guided along their path towards the destination or destinations they intend to approach. [Peponis,

1990].

Strategic wayfinding design:

When signs system is created for an area or building or architectural structure, it is essential to develop strategic design that enables us to deal with the richness of details we encounter when interaction is made with real natural environments. [Klippel, Alexander, 2003]. Hence, person is able to build the units of wayfinding system, which would adapt with build environment as well as human expectations for guidance and navigation. The scientific research is considered an important step to understand the built environment, whereas information is needed in order to achieve the maximum possible clarity in the wayfinding system.

Signage design types:

There are four important types of signs:

1. Information signs: They are vertical outdoor signs, which display information needed by navigator about the area or quarter or city. Figure (3).



Figure 3: Outdoor information sign: Old Alexandria city, Virginia State, United States of America.
https://www.alexandriava.gov/news_display.aspx?id=95355

2. Directional signs: They are indoor signs, which use symbol and text to assist the navigator to find his destination. They are placed at several strategic points within the build environment. Figure (4).

Figure 4: Models of indoor directional signs, whereas the symbols therein enhance the text message.
http://www.mylobbysigns.com/custom_signs/directional-signs-page.html

3. Identification signs: They are indoor signs through which individual locations are identified such as meeting room, sites, and public facilities, etc., as shown in Figure (5).



Figure 5: Indoor identification sign of registration department. It shows room's number and it contains text writing as well as "Braille" writing.
https://www.howardindustries.com/products/ada-compliant-room-identification-signage#

4. Warning signs: They are also indoor signs aiming to highlight on safety procedures such as fire escape ways, no smoking areas, in addition to other information regarding the permitted or not permitted in certain area. Figure (6).



Figure 6: Model of indoor emergency sign, which includes large texts, illustrative images, lights, alarm identifiers, and color coding that are used to assist everyone to find emergency equipment and directions.
http://idea.ap.buffalo.edu/udny/Section4-1c.htm

To make the signage system work together, design grid is used to organize information and setting of signs measure in different sizes as part of the sign family; for example, fundamental base can be used from 30mm divided by 9. All measurements of example are based on the division 9 x 9. Care should be taken not to display too much information on single sign in order to ensure that it is not easily ignored, and instead, multiple signs should be used to obtain good results about identification of path. Figure (7).



Figure 7: Model of grid design to organize information and setting of measurements.
http://designworkplan.com/wayfinding/introduction.htm

Signage typeface:

The Signage fonts are usually sans-serif type that is available in different weights together with simple and readable design. The fonts had good clarity with X-Height and wide letter ratios along with visible ascenders and descenders to ensure ease and quality of reading. Figure (8).

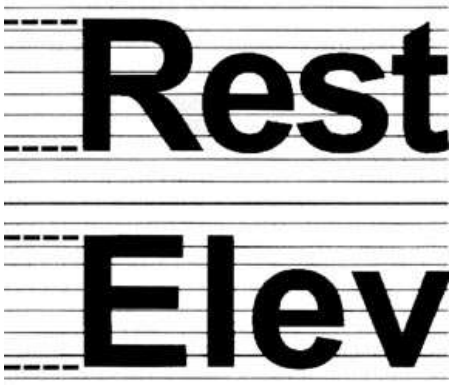


Figure 8: Model of text plan, which shows distance to boost the clarity.
http://idea.ap.buffalo.edu/udny/Section4-1c.htm

When using readable font, this practice would reflect the distinction of typeface for many people and can be read and clearly understand the message. Therefore, the selection of signage typeface is one of the major factors in the success of function of path identification system. When selecting signage typeface/wayfinding project, it is preferred to use the following characteristics:

- Sans-serif design of clear and straightforward font.
- Form of message that is easy to recognize.
- Positive letters distance to enhance the visual appearance.
- The Font Family shall include set of different weights.
- The typeface shall contain X-Height to ensure ease and quality of reading.

Color:

The usage of color to create consistency in "wayfinding" information is limited to the need for contrast. Any color can be used on signage provided that adequate contrast is available between the color of back and any colors used for messages and symbols. Colors contain reflection of light reading (often written on paint or ink samples). By subtracting the darker reading from the lighter reading in terms of weight and multiplying by 100, we would be able to calculate the luminance contrast between colors. When the contrast in luminance is 70% or more, clear differentiation can be achieved between the color of message versus the back color. The degree of visibility of sign is always greater when the back is dark color. Nevertheless, the luminance difference will be the same regardless whether lighter or darker color is used in the back.

Color Coding:

Color coding system is often difficult regarding large complicated areas because this requires large number of colors. There are nine basic colors in addition to the black, white and grey, which represent the only colors commonly used in color coding system, because color coding requires the colors agreed upon such "red", "blue", "yellow", "green" and so on. Using more than one shade of the same color increases the possibility of confusing the recipient. There are no sufficient colors to code each unit at complicated facilities such as hospitals, because number of departments in most cases exceeds the available colors. Moreover, most users of facility for the first time will not remember all used colors.

The color coding system can function on geographic basis, which would add for example to identity of area various buildings inside the campus of health facility that may have different colors in its path identification systems. This is particularly useful when creating communications between buildings over time and it would enhance the conception of navigation from an area to another.

But however, locations must not completely depend on color coding to support "wayfinding" information. Instead of trying to color coding different units throughout the entire facility, color coding can be used to implement communication among some important rooms, for example, all doors of comfort rooms can have one color while all doors of comfort rooms assigned for employees only can have another color. It is worthy to note that combination between written signage and symbols would enhance recognition of these areas.

Signage design:

The following must be taken into consideration for signage design:

- Adequate usage of typography.
- Height of characters typed.
- Symbols.
- Design of grid.

- Color.
- Selection of execution materials.

Signs should also be designed as frontal straightforward in a manner that is consistent with the wayfinding plan. The same arrangement must always be used when information are presented, Figure (9). Furthermore, samples must be made from different types of signs and checked in build environment to ensure that design is in conformance with the optimum practices. [Passini, 1984b].



Figure 9: Model of signage design
http://designworkplan.com/author/admin/page/2

The best way to perform "wayfinding" task is to fully integrate the experience of user through sensorial qualities, graphic indicators (signage) and spatial hierarchies. The graphic indicators (signage) and spatial hierarchies will collectively indicate the spatial characteristics that support movement sequencing through the "wayfinding" system by the collection of building models together.

The door, the arrow, the corporate identity, as well as the logo, and the traffic sign — all these things represent only the appearance in terms of our cognition that is unified and distinguished through the signs which embody the world of things, products and activities. Therefore, our existence afterwards becomes more symbolic, because it exists more and more inside Idiographic World upon which we prepare our activities not with the goals themselves, but together with the signs that highlight on them. [Parsons, Alan, 2011].

The Findings of Research:

1. The graphic design had two important components, as follows:

a. The Typography component from which text writings arise.

b. The Pictograms component from which visual charts and graphs arise.

And when they come together, they form text message supported by visual symbols, which would enable a person to quickly navigate to the destination he intends.

2. The importance of graphic design elements is elevated in the process of building graphic "wayfinding" systems, which strengthens ease and quality of signs reading, hence, this practice would pave the way for navigator to identify his location, goal and next destination pursuant to the available characteristics.

3. The graphic design used in building graphic "wayfinding" systems supports the ability of person to comprehend and understand the build environment and ability to guide himself inside the build environment and navigate from an area to another depending on fixed signs that contain texts, symbols, maps, pictures, models and charts.

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