EXPLORING GUIDANCE AND SIGNING SYSTEMS IN ENVIRONMENTAL GRAPHIC DESIGN AS INFORMATIONAL DESIGN: A STUDY USING GRAPHIC DESIGN EXAMPLES

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Abstract: *Knowledge means power. Having knowledge has empowered human beings and provided new opportunities throughout history. Nowadays, with technological developments, accessing information has become easy for everyone.*

"Information Design" has emerged as an interdisciplinary field facilitating efficient access to necessary information and transforming complex data into comprehensible formats for broad audiences. Its primary objective is to ensure accessibility and understanding of intricate information. Currently, information design actively guides and simplifies information transfer through visual elements such as guidance and marking systems, symbols, graphics, pictograms, maps, panels, and typography.

Environmental graphic design encompasses the planning, design, and presentation of graphic elements within communication systems deployed in both natural and constructed environments. This discipline encompasses guidance systems, markings, display designs, corporate identity graphics, urban design, pictogram design, store design, mapping, and thematic landscaping.

Environmental graphic design has increasingly integrated into everyday life through the implementation of guidance and marking systems. Guidance designs enhance efficiency, create positive impressions, and foster a sense of safety in unfamiliar environments. Meanwhile, marking designs serve as visual indicators directing individuals towards their destinations.

Presently, elements such as information, guidance, and signage facilitate communication between urban environments and inhabitants. Beyond their primary roles in guiding, informing, and delineating within cities, these elements play a crucial role in enhancing urban identity, improving legibility and coherence within the cityscape, and fostering a harmonious relationship between people and their urban surroundings.

This study focuses on typography, a fundamental aspect of information design. Through an analysis of information, guidance, and marking systems, it becomes evident that elements such as signs, directional cues, symbols, pictograms, and traffic signs, integral to environmental graphic design, are closely interconnected with typography.

This study conducted a thorough review of sources to ensure the provision of original and comprehensive content. The research primarily utilized printed visual sources, augmented by archival research, internet and library databases, books, magazines, articles, and theses. Findings were presented through detailed explanations, quotations, comparisons, and identification of common themes.

This article comprises five stages. The first stage introduces the study, encompassing definitions of communication and graphic design, and an exploration of the concept of perception. The second stage defines the relationship between urban spaces and information design, discussing contemporary urban dynamics, urban identity, the intersection of urban spaces with graphic design, visual elements in urban environments, and the role of environmental graphic design. In the third stage, the study explores the role of typography in information design within urban contexts, defining information design principles, application areas, components such as typography, pictograms, symbols, emblems, and signs, and discussing criteria for readability and perceptibility in typographic analysis within information design. The fourth stage focuses on a typographic evaluation of routing systems through illustrative examples. Case studies of exemplary institutional guidance systems are examined, and recommendations for enhancing these systems are presented using tables and graphs. Finally, the study concludes with a summary of findings, evaluations, and proposed solutions.

1. INTRODUCTION

Possession of knowledge has historically empowered humanity and provided new opportunities. Today, with technological advancements, access to information has become easy for everyone. However, as the amount of accessible information increases day by day, individuals are faced with the necessity of selecting the specific information they wish to access among a vast array of data. Consequently, "Information Design" has emerged as an interdisciplinary field that facilitates quick and efficient access to needed information by transforming data into forms understandable by the masses. The use of informational, directional, and signage elements has gained even more significance in modern cities, particularly in metropolises with increasing numbers of vehicles and populations. The planning, design, and presentation of graphic elements contained within communication systems used in both natural and man-made environments is referred to as environmental graphic design.

In our era, as contemporary and developed cities continue to expand over larger areas and the population living within these areas increases, modern cities have become increasingly complex. As a result, the role of information design in ensuring the accurate and efficient direction of information has become critically important. In our country, with the changes in socio-economic conditions, the visibility and effectiveness of information design have also increased.

The human being is constantly in communication and interaction with their environment. This process, which can be referred to as the exchange of information, encompasses various concepts. These concepts include motives and needs, which are the sources of human behavior, perception, which refers to the understanding and recognition of the environment, and cognition, which involves processes such as gathering, storing, organizing, reconstructing information, and recalling images. Today, information has become more accessible compared to previous times. Possessing information and being able to use it efficiently and swiftly facilitates our lives and increases the productivity of our experiences. In this era, where we can easily say we live under a bombardment of information, selecting the necessary information becomes crucial. The environment always contains more information than a person's cognitive capacity can process. Therefore, individuals must select from among the information that exceeds their cognitive capacity. The primary goal of information design is to make complex information understandable and accessible. At this stage, information design plays an active role in guiding individuals and assumes the responsibility of conveying information in a clear and accessible manner.

Zillioğlu emphasizes the importance of thoroughly understanding the communication process and its stages for effective comm-unication, and outlines these stages as follows:

In order to establish effective communication, it is essential to thoroughly understand the communication process and its stages. This process, referred to as the "Bullseye Model" (Figure 1), consists of five stages: sender, message, communication channel (media), receiver (target audience), and feedback. The initiating element of the communication process is the "sender" (Zillioğlu, 2000).

As seen in the figure below, the target audience to whom the message is conveyed constitutes the "receiver" stage in this model. The final stage of the communication process is "feedback." This stage is concerned with informing the sender about whether or not the message has been perceived by the receiver.
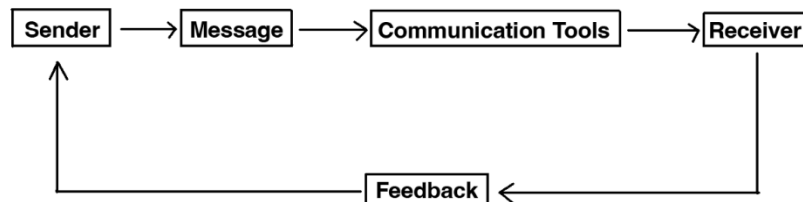

Figure 1: Bullseye Model"

Graphic Design is defined as a visual tool that presents the intended subject in an effective, informative, and aesthetic manner. Perception is the process by which stimuli recorded by the sensory organs are organized and interpreted by the brain, thereby becoming meaningful. It is a complex phenomenon formed through various mental processes, which constitutes the basis of human communication with the environment, allowing individuals to acquire information about their surroundings and make use of it. The term "graphic" refers to concepts related to visually perceived objects, namely images. Communication, on

the other hand, is the exchange of any kind of information between people. Visual communication can be defined as the exchange of information between individuals through images, without the need for verbal language—in other words, the exchange of information composed of images. Among all forms of communication, "visual communication," which occurs through sight, is the most effective and significant. Visual communication is a universal form of communication that enables people to communicate via symbols and signs. In environments where speech is not possible, "visual communication" is the only form of communication that allows us to connect with our surroundings. According to J. Bowers, in graphic design, the content of messages should be organized according to a specific structure. In graphic design, messages are the elements that enable the transmission of information between sender and receiver: "Messages can be created solely from elements such as colors, symbols, letters, or photographic images. Individually or together, these elements establish communication between the sender and the receiver, facilitating the transfer of ideas, concepts, and information." (Bowers, 1999)

An individual's ability to perceive simple and complex messages from their environment, adapt to environmental conditions, and learn and utilize their surroundings depends on these factors. This is only possible when the stimuli in the environment are accurate, sufficient, and perceivable. A person's ability to constantly monitor and perceive their surroundings is related to their capacity to select messages with related and similar characteristics from among the bombardment of intense information. This is referred to as "selective perception." Just as a person can easily perceive a single object or form in the environment, they will also more readily perceive objects or forms that form an organization, compared to those that are complex or disorganized. In graphic design, unity is achieved by arranging all design elements in relation to each other to create a sense of completeness. The viewer always seeks unity in a message; otherwise, they lose interest in the design. The human eye and brain strive to make sense of everything they see. To do so, they complete unfinished forms, group similar ones, and attempt to establish a figure-ground relationship. Wayfinding, informational, and signage systems-key aspects of environmental graphic design, one of the most important subcategories of information design-must ensure the aforementioned elements in order to establish an accurate and efficient wayfinding and informational system. The selection and use of typography, one of the graphic elements, will significantly affect the success and functionality of this system. When creating a design, the choice of font and font family, the point size, weight, and spacing, the color, its contrast with the background color, its relationship with the environment, and its alignment with corporate identity will be the most decisive factors.

1.1 Problem

The effective and efficient use of information design relies on fundamental graphic elements that ensure clarity and functionality. For institutions to establish effective communication, it is essential that they reflect their identity in a distinctive manner. Among the institutions that prioritize corporate identity and strive to create typographic consistency, universities are among the most prominent.

In this study, guidance and information systems for indoor and outdoor signage systems, particularly in large and crowded spaces of Turkish and foreign university campuses, have been examined through their design guides. An exemplary model has been developed based on Istanbul Technical University.

Due to the lack of a study or systematic proposal establishing a standardized system for signage and wayfinding in universities in Turkey, there was a need to conduct such research. The main problem addressed by this study is to determine how an information design system should be structured to ensure that the wayfinding and information design systems used in university campuses are more functional, effective, and visually cohesive, by analyzing them from the perspective of graphic design elements and communication.

This study will also address typography, which is a significant aspect within the broader scope of information design. The examination of wayfinding, signage systems, and environmental graphic design reveals that various details such as signs, wayfinding systems, symbols, pictograms, and traffic signs are closely related to typography.

The study focuses on the role of typography in information design across university campuses at the urban and spatial scale, with a proposed model titled "The Role of Typography in Information Design in University Campuses: A Proposed Model."

The general aim of the research is to contribute to future studies by analyzing the graphic design elements and communication aspects of wayfinding signage, nameplates, and other informational design elements that enable students, faculty, administrative staff, and visitors to easily navigate university campuses. During the course of this research, the signage and wayfinding system manuals of selected foreign

universities for both indoor and outdoor spaces were examined, and it was observed that there is a significant gap in this field in Turkey. The aim is to establish manuals for wayfinding and signage systems for every university in Turkey, thus ensuring a system aligned with each institution's corporate identity.

In line with this goal, the following questions will be explored:

- Are the quantity and dimensions of the informational design elements in university campuses adequate?
- Do these informational design elements convey information in a functional and comprehensible way?
- Do these informational design elements reflect the institution's corporate identity?
- Do these elements maintain visual integrity?
- Are the placement locations of these informational design elements chosen correctly?
- Are there sufficient numbers of these elements in university campuses?
- Are these informational design elements readable and perceivable from a distance?
- Is there a significant difference between public and private universities in terms of user perceptions of the informational designs?
- Do the colors used capture the users' attention?
- According to users, do the symbols, signage, and colors in university campuses, particularly at turnstiles and elevators, provide sufficient information for people with disabilities to navigate?
- Do users believe that the ground graphics, directional signs, and information boards in university campuses provide adequate information?
- Do the symbols, typography, and colors used in all the stops draw attention through their design?
- Do universities have standardized signage and wayfinding manuals that are designed in line with their corporate identity?

The significance of this research lies in its aim to establish a standard for the use of information design in university campuses, making it the first study on this subject. By addressing information design from the perspective of graphic design elements and communication in university campuses, the research is expected to contribute to solving issues encountered in this area. Furthermore, it is anticipated that the findings will benefit users and university administrators by facilitating social life, enhancing information transfer, and providing accurate wayfinding. The recommendations to be presented regarding how information design products should be structured will highlight the importance of this topic.

The study observed that the Standard Wayfinding and Signage Manuals of American universities examined during the research could serve as a model for Turkish universities. This research is limited to the campuses of Istanbul Technical University, Marmara University, Kadir Has University, and Sabancı University, located in Istanbul, Turkey. In the final stage of the study, Istanbul Technical University was selected as the exemplary model.

1.2 Methods

By examining the wayfinding and signage manuals used in the United States, it has been determined that there is a need for standardized manuals for each institution in Turkey. A comparative model study was conducted based on Istanbul Technical University (ITU). As a result, a two-part standard manual, covering both indoor and outdoor spaces of the ITU campus, was designed.

The research scope involved examining eight universities in the United States, with the two best institutions selected as model examples. Two public and two private universities in Istanbul were also selected for comparison. The study found that such work had not been previously conducted at any university in Turkey. Since the research describes an existing situation within its given conditions, a descriptive method was chosen. Accordingly, a fieldwork model was preferred due to its relevance to the research objective and subject matter.

To collect data, the manuals of American universities were accessed and analyzed online. Interviews were conducted with representatives of universities in Turkey, and physical visits were made to two public and two private universities in Istanbul. Photographs were taken, and the physical spaces were examined to identify deficiencies and issues in the universities' wayfinding and signage systems.

This article consists of four sections. The first section is the introduction, where the problem statement, research objective, significance, methodology, assumptions, limitations, definitions, and method are explained.

In the second section, the relationship between urban space and information design is defined. It explores the modern relationship between urban space, urban identity, and the connection between urban space and graphic design, including the visual elements and environmental graphic design within urban spaces.

The third section discusses the role of typography in information design at the urban space scale and defines the concept of information design. The principles of information design are elaborated upon, along with its areas of application and components, such as typography, pictograms, symbols, emblems, and signs. Criteria for legibility and perceptibility in typographic analyses within information design are also explained.

The fourth section evaluates wayfinding systems in universities from a typographic perspective. The wayfinding systems of the model universities are analyzed, and suggestions for improving the wayfinding systems of universities in Istanbul, Turkey, are presented in tables. Following this, conclusions are drawn, and evaluations and solution proposals related to the topic are provided.

2. RELATIONSHIP BETWEEN URBAN SPACE AND INFORMATION DESIGN

People spend a significant portion of their daily lives in urban spaces, living within architectural environments. The spaces in which they reside influence their lifestyles and behaviors. Louis Wirth defines a city as "a relatively large, dense, and permanent settlement of socially heterogeneous individuals (Wirth, 2002). Public spaces, from streets to squares and parks, constitute the most essential parts of cities. Therefore, the quality of public spaces, particularly streets and squares, plays a crucial role in shaping a city's identity. Public spaces have historically played an important role in the formation of cities. As stated, "Individuals sustain their socio-cultural lives through the experiences and activities within outdoor spaces as part of the urban physical environment. In this sense, the structuring of society occurs in open public spaces, where the relationship between individuals and society is supported by the physical environment." (Erdönmez, 2005).

2.1 The T-Relationship Between Urban Space In Contemporary Context

Since the 1970s and 1980s, with the rapid rise of globalization and the accompanying transformations in the economic structure, urban public spaces have emerged in various forms such as shopping malls, theme parks, supermarkets, and fast food restaurants. Today, identical consumption habits and the lifestyles that result from them are found in cities and metropolises around the world. Modern cities are increasingly becoming centers of consumption.

2.2 Urban Identity

Every city has its own unique architectural structure, lifestyle, or in other words, identity. The core values of urban identity are shaped by historical and cultural heritage. The impact of social and spatial changes over time on the inhabitants forms the identity of a city. A city is a settlement system with its own unique characteristics, enabling the resolution of complex societal issues that cannot be addressed by individual efforts. Urban identity is shaped through the standardization, homogenization, and regulation of the visible material elements of culture such as the architectural fabric, street furniture, and urban landscape. Additionally, cities are structured to meet the entertainment, arts, sports, and other needs of the social groups living within them.

By designing the city as a living space with elements such as buildings, landscaped areas, transportation systems, and pictograms, the suitability of this space for use, its functionality, and its contribution to the organization of daily life are ensured. As a result, a visual identity of the city emerges. As previously explained, the city's visual identity is the creation of all the visual elements that communicate with the external world around a design concept, based on the city's physical presence within its geographical context.

2.3 Relationship Between Urban Space and Graphics

For people living in modern cities, completely losing their way is perhaps a rare occurrence. The presence of other individuals and urban elements—such as maps, street names, road signs, and bus stop signs—make it nearly impossible for a person to be entirely disoriented. It is at this point that the importance of information design in urban spaces becomes evident.

2.4 Visual Elements in Urban Space

The messages conveyed to an individual from their surroundings help them understand and navigate the space, facilitating movement within it. A person meets their needs such as transportation, relaxation, acquiring information, and shopping through visual images in the environment, in other words, through graphics. Graphics are communication elements. Therefore, the visual communication tools present in urban life make the environment more accessible. The spaces in cities, which are the smallest units where life unfolds for urban dwellers, represent a multidimensional view of the experienced and perceived environment. The urban setting or urban fabric consists of spaces, and these spaces are composed of city elements. Environmental graphics, which facilitate communication within the built environment, create a sense of place using two- or three-dimensional graphics, forms, and signs. Furthermore, environmental graphics enhance the appreciation of the environment and strengthen the local identity of the space. Through environmental graphics, which inform individuals of the time and place, not only physical but also social problems are addressed.

"Environmental graphic design," which is a discipline within information design, is a field that inherently intersects with various other disciplines. The Society of Environmental Graphic Design (SEGD) defines environmental graphic design as follows: "Environmental graphic design encompasses various design disciplines such as graphic design, architecture, interior design, and industrial design, all of which focus on the visual aspect of wayfinding, communication identity, information dissemination, and shaping the perception of space."

"According to Deborah Sussman, founder of the renowned environmental graphic design firm Sussman & Prejza in the United States, environmental graphic design is the natural evolution where fine arts transform into visual communication and a sense of environmental work." (Teresa-Steven, 2002)

Applications of Environmental Graphic Design encompass outdoor graphic design, wayfinding systems, signage design, exhibition designs, pictogram design, mapping and thematic environmental arrangements, vehicle graphics design, event designs, point-of-sale graphics, clothing graphics design, and corporate identity graphics. Environmental graphic designs are typically applied to institutional spaces such as universities, hospitals, shopping centers, museums, parks, and sports facilities. Examples of environmental graphic design elements, which can be designed using temporary or permanent materials, include flags, signs, signposts, booths, exhibition graphics, advertisements, and billboards.

As an essential component of Environmental Graphic Design, wayfinding and signage design refer to the visual design that helps users navigate and locate their destinations in indoor or outdoor spaces. Signage design is a visual system indicating the point reached. The existence of wayfinding design enhances efficiency, creates a positive impression of the space, and provides users with a sense of security in unfamiliar environments. Wayfinding design creates visual elements aimed at guiding the user in a particular direction, often utilizing directional arrows. Signage design, on the other hand, refers to visual markers that indicate the destination. For instance, a sign at the end of a long corridor showing the unit reached is an example of signage. Entrance signs, door signs, intermediate maps, and lists all fall under the category of signage. Both wayfinding and signage design are integral parts of environmental graphic design and contribute to corporate identity design. Signage systems, as part of environmental graphics, serve functions such as providing information, facilitating the user's adaptation to the space, giving the space an identity, directing the user within the space, and contributing to the decor.

3. THE ROLE OF TYPOGRAPHY IN INFORMATION DESIGN AT THE URBAN SPACE SCALE

The role of typography used in informational design at the urban space scale will be examined in this section. Typography is one of the main subjects of graphic design. Accordingly, the focus will be on the place of typography within informational design in the context of urban spaces.

3.1 The Concept and Definitions of Information Design

"According to the International Institute for Information Design, information is data that can be accessed and utilized by people. Design, on the other hand, involves identifying the problem and creating drawings or plans that detail the technical characteristics and descriptions of the product, which will be presented through the designer's qualified creativity. Information Design is the process of determining, planning, and

shaping the content of a message and the medium through which it will be delivered, in accordance with the specified needs of the users" (Durmaz & Ergüven, 2009).

Information design also plays a guiding role in creating a happier and healthier world. The resulting product is universally effective and aesthetically pleasing. Today, when referring to information design, it is commonly understood as the aesthetic graphic design of informational material. Information design is a contemporary design field that spans a wide range of areas, from informational graphics to wayfinding design, from pictogram design to signage system design.

"Information design can utilize all elements inherent in graphic design, such as line, shape, colour, balance, space, void, typography, and photography. Depending on its function, it must take into account the socio-cultural characteristics, psychology, habits, and perceptions of the target audience; spatial data such as sound, light, size, and distance, as well as ergonomics; and the use of technological capabilities" (Oral, 2009).

Wayfinding signs, which are part of information design, are essential visual markers that guide users, especially in traffic, at main entrances, and on both indoor and outdoor building signage. In addition to being accurate, clear, and easy to understand, these wayfinding signs should convey information correctly while also reflecting the institution's identity. The colour, typography, and form that comprise the visual design language must align with the institution's visual identity. Graphic design elements such as typography, colour, and form, which are used in information design, play a crucial role in giving a space its identity. When transferring information, criteria such as legibility, simplicity, clarity, and consistency with the institution's identity should be taken into account. The components of information design include typography, pictograms, ideograms, symbols, emblems, and signs.

"Typography, which has been defined in various ways throughout its development, can be understood in contemporary typography (especially since the 1980s, when computers began to permeate all environments) as both the visual, functional, and aesthetic arrangement of letters and other textual-visual communication elements, as well as the design language and concept created with these elements" (Sarıkavak, 2004).

Due to its communicative function, readability must be prioritized in typography, and communication should never become unclear for the sake of aesthetic concerns. The primary function of typography, one of the elements of graphic communication, is 'to be read.' A typographic arrangement that ensures readability is always successful. Geometric or non-geometric elements, lines, shapes, spots, sections, letters, and numbers are the main components of typography'. A sequence of typographic characters consisting of letters, numbers, punctuation marks, and other symbols is called a 'font.' Letters are symbols that correspond to the sounds we use in spoken language and possess specific forms. A complete set, composed of uppercase and lowercase letters, numbers, punctuation marks, and mathematical symbols, which has been finalized and made available for use, is referred to as a 'typeface.

The primary visual elements used in information design include wayfinding and signage systems, symbols, graphics, pictograms, maps, panels, and typography designs. A pictogram is a form of visual writing created in a simplified manner with symbols to visually represent a concept or idea. Pictograms are graphic symbols that facilitate international communication and express an object or the meaning of those objects. Since a universal language is used in pictograms, they must be designed in a simple manner that can be understood by people of all ages and cultures. Symbols are signs that represent a specific person, object, group, idea, or a particular combination of these. Visual symbols, which enable communication, are visual and auditory phenomena that convey more than what is directly shown. The use of symbols aims to facilitate communication and information sharing, while also striving to establish a universal common language. 'They are icons that provide identity to organizations that produce products or services, created with abstract or objective images or letters, and do not possess the properties of words' (Becer, 2005). 'Signs are symbolic elements that represent events or objects. In other words, signs are linguistic elements, gestures, or facial expressions used to express a thought or indicate a request or command' (Larousse Encyclopedia, 1971).

3.2 Criteria for Readability and Legibility in Information Design

"Readability is a term used to describe the quality sought in typefaces, words, book pages, posters, signage, and many other forms (Ruder, 1967).

The perceptibility and readability of a typographic design indicate that it is fulfilling its function as a communication tool. Readability varies based on the application of rules regarding spacing, line length, and the time required for reading and comprehension. Therefore, typographic arrangements in informational

design should be made with these concepts in mind. In both indoor and outdoor spaces, a typographic layout that is difficult to read affects the perception time in informational design.

One of the most significant factors influencing readability is spacing. Spacing is one of the fundamental elements of a good typographic design. The design rules that must be applied to letters, words, lines, paragraphs, columns, headings, and subheadings also encompass the surrounding space.

The literal meaning of spacing is "space," "gap," or "distance." It is a term used in the visual arts and graphic design, particularly in typography. Generally, "spacing" refers to the appropriate gaps left between letters, words, lines, and paragraphs (Carter-Day-Meggs, 2002).

Another criterion of readability is contrast. Contrast is one of the most basic principles of typography and design. The ease of perceiving and reading a typeface depends on a series of contrasting values such as dark-light, circular-straight, narrow-wide, vertical-horizontal, thick-thin, large-small, symmetrical-asymmetrical, and static-dynamic. In a signage system, the readability of the typeface applied—ensuring that users can access information correctly—is also important in terms of readability.

4. EVALUATION OF WAYFINDING SYSTEMS FROM A TYPOGRAPHIC PERSPECTIVE THROUGH THE EXAMPLE OF UNIVERSITIES

University campuses have been chosen as examples for examining typographic arrangements in informational design at both urban and spatial scales. One of the main reasons for focusing on university campuses among all examples is that they encompass both urban and spatial dimensions. In this context, examples will be grouped under main categories, classified as either international or national, and the wayfinding systems of these examples will be analyzed comparatively based on a specific classification system. During this analysis, the deficiencies identified in the national examples will be highlighted, and recommendations for addressing these shortcomings will be provided. Data on international examples will be gathered from the literature, while field studies will be conducted for the national examples. In the initial phase, a literature review will be conducted to develop a classification system.

4.1 Classification of University Guidance Systems

In conducting a literature review on the classification of wayfinding systems at the international level, the campus wayfinding system guides of the following universities were examined: Duke University, University of Michigan, North Carolina State University, The Ohio State University, The University of Texas at Austin, University of California San Francisco, The University of British Columbia, University of Miami, University of Guelph, University of Nebraska-Lincoln, University of Minnesota, Utah State University, and York University. The analysis revealed that the wayfinding systems of York University and the University of Nebraska serve as exemplary models, as they encompass all subgroups of a comprehensive wayfinding system.

From a typographic perspective, the wayfinding system guides of York University and the University of Nebraska are considered good examples due to several characteristics: readability, perceptibility, alignment with institutional identity, clarity in delivering necessary information to users, accessibility to people from all languages and cultures, the establishment of a unified graphic language throughout the entire campus, and a consistent visual and typographic harmony.

At this stage of the thesis, the wayfinding systems of four different universities in Turkey, two public and two private (foundation) universities, were selected for analysis. These universities are as follows:

1. Public Universities:
    a. Istanbul Technical University
    b. Marmara University

2. Foundation Universities:
    a. Kadir Has University
    b. Sabancı University"

It has been identified that the interior signage system at Istanbul Technical University (ITU) contains numerous problems. Similarly, it was found that Marmara University has similar issues, and the informational and room signage systems were deemed inadequate. ITU's Ayazağa campus is spread across a large area and consists of a vast, crowded, and multi-unit structure. Therefore, the outdoor wayfinding systems are of significant importance. However, fieldwork has revealed that there is no wayfinding system in this large area that adequately and functionally serves both pedestrians and vehicles. Additionally, it was observed that ITU's various campuses do not share a unified design or visual language in terms of the

wayfinding system. Design decisions regarding the graphics, colors, fonts, font sizes, and spacing adjustments were found to be incorrect. As a result, the existing wayfinding system lacks the necessary functionality for both pedestrian and vehicular traffic. Similar problems were also identified in the wayfinding systems of Marmara University and Kadir Has University, which were taken as model examples. Kadir Has University's informational and room signage systems were found to be insufficient. Fieldwork revealed that the implemented wayfinding systems differ across the various campuses. Among these, the Balat Main Campus had the best system, but even there, the wayfinding system was incomplete and did not cover all units within the campus. Pedestrian wayfinding ends abruptly at certain points, and foreign visitors are unable to navigate to their desired locations using the system. Furthermore, the wayfinding system at Kadir Has University fails to adhere to the institution's corporate identity, especially in terms of color. In addition to being non-functional, it also suffers from readability and perceptibility issues. Specifically, the choice of font characters, font sizes, and spacing adjustments were not made correctly. The locations of the signs were also found to be poorly selected.

Sabancı University's main advantage over the other universities in terms of its wayfinding system is that it operates on a single campus. Upon examining Sabancı University, it was found that many signs are sufficient, yet they are not functional. The signs are difficult to notice in their current locations, and their readability is low due to inappropriate font types and sizes. However, compared to the other examples, Sabancı University has far fewer deficiencies in its wayfinding system. The form and size of the wayfinding system were not adequately designed for the large area, resulting in perceptibility issues. It was also determined that incorrect choices were made regarding the graphics, colors, font types, font sizes, and spacing settings, causing readability problems. As a result, the existing wayfinding system lacks the necessary functionality for both pedestrian and vehicular traffic.

When comparing the interior wayfinding systems of two public and two private (foundation) universities with campuses in Istanbul, it was found that the foundation universities had a more systematic approach to design than the public universities. Nevertheless, deficiencies were identified in the wayfinding systems of the foundation universities as well. Comparing the outdoor wayfinding systems revealed that both public and foundation universities share similar problems. It appears that universities generally place more emphasis on their interior spaces when establishing wayfinding systems, while giving less consideration to the exterior spaces. When comparing the wayfinding systems of the selected Turkish and international universities, significant differences were found between them. Additionally, it was observed that international universities possess wayfinding system guides that go beyond their corporate identity guidelines, providing detailed information and adhering to these guides when implementing and developing their wayfinding systems as needed.

Based on the identified problems, a two-part sample design model, focusing on both indoor and outdoor signage systems, was created for university campuses using ITU as a case study. In the sample designs, the use of institutional colors and the selection of the "DIN" font family, including the appropriate font weights, font sizes, letter, word, and line spacing, resulted in an effective and functional design model. The wayfinding and informational signage within the design, through the correct selection of typographic and graphic elements, ensures ease and clarity in both readability and legibility.

4.2. Examination of the Wayfinding Systems of Selected Turkish and International Universities as Example Models

The selected universities will be analyzed under two categories, with two examples for each category. These two categories are public universities and foundation (private) universities.

4.2.1 Public Universities

Two examples of public universities have been selected: Istanbul Technical University (ITU) (Figure 2) and Marmara University (Figure 3).

4.2.1.1 Istanbul Technical University (ITU)"

Figure 2: The study of examples related to the examination of İ.T.Ü's guidance systems

Upon examining ITU's wayfinding systems, it was observed that there is no visible institutional visual coherence in the door signage (a, b) and informational signs (c, d), as shown.

4.2.1.2 Marmara University

Figure 3: Examples related to the examination of Marmara University's guidance systems

An examination of the wayfinding systems at Marmara University's campuses revealed that the door signage and informational signs (a), departmental informational signs (b), outdoor wayfinding designs (c), and general use area signage, including restrooms, lack sufficient graphic and typographic elements. These signs fail to establish an institutional visual coherence, resulting in readability and legibility problems.

4.2.2 Private Universities

Two examples of foundation universities have been selected: Kadir Has University (Figure 4) and Sabancı University (Figure 5).
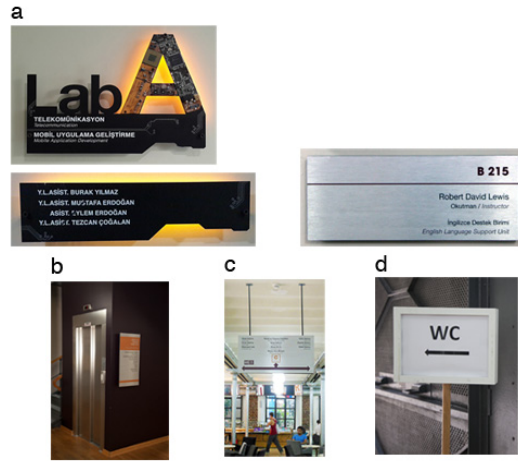
4.2.2.1 Kadir Has University"

Figure 4: Examples of the Examination of Kadir Has University's Wayfinding Systems

An examination of the wayfinding systems at Kadir Has University revealed that the door signage and informational signs (a), elevator wayfinding (b), indoor wayfinding designs (c), and general use area signage, including restrooms, lack sufficient graphic and typographic elements. These signs fail to establish an institutional visual coherence, resulting in readability and legibility problems.
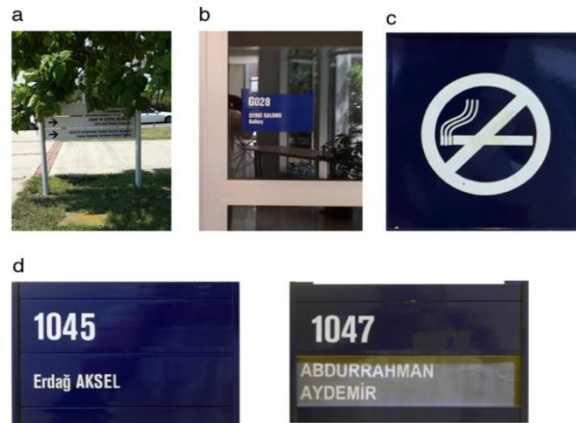
4.2.2.2 Sabancı University

Figure 5: Examples of the Examination of Sabancı University's Wayfinding Systems

An examination of Sabancı University's wayfinding systems revealed issues with parking and outdoor signage (a), exterior building identification signage (b), and warning signs, such as the 'No Smoking' pictogram, which was designed in the university's corporate color, resulting in a major mistake. By not using the necessary red color for the warning sign, it failed to create the required cautionary effect. Additionally, it was observed that door signage for two professors with the same title had different visual designs.

4.2.3 Comparison of ITU Informational Designs Based on Deficiencies and Proposed Model

The comparison of the informational designs of Istanbul Technical University based on deficiencies and the proposed model is conducted under the following headings.

4.2.3.1 Door Signage for University Employees Identification

The previous state of the door and door signage was characterized by graphic confusion, rendering it ineffective due to the incomprehensibility of the typographic and graphic design elements used. A solution to this problem has been proposed above. As demonstrated in the example model for Istanbul Technical University (ITU), a Wayfinding and Signage Guide has been prepared, standardizing all aspects.

Figure 6: Comparisons Between the Design and Previous Examples Associated with İ.T.Ü.

4.2.3.2 Indoor Wayfinding Signage for Pedestrians

It has been determined that wayfinding signage related to indoor areas is not utilized in large spaces such as university campuses.

Figure 7: Comparisons Between the Design and Previous Examples Associated with İ.T.Ü.

4.2.3.4 Wayfinding Signage for Campus Outdoor Signage System

The use of wayfinding signage located outside university campuses is very important. Special attention should be given to these elements, particularly in large campuses. Pedestrians, especially foreign visitors, have a strong need for these wayfinding signs.

Figure 8: Comparisons Between the Design and Previous Examples Associated with İ.T.Ü.

4.2.3.5 Building Entrance Signage for Outside

The use of exterior building entrance signage in outdoor spaces is a crucial criterion. People want to know what a space is when seen from the outside. Information regarding these spaces should be arranged in a way that can be easily read, particularly for foreign visitors. In order to improve the wayfinding systems of universities, it is essential to collaborate with a professional team consisting of graphic designers, architects, interior designers, landscape architects, and industrial product designers. The "Wayfinding System Guide" that this team should base its work on must consist of two sections: one for interior spaces and one for exterior spaces. The designed wayfinding system guide must be prepared in detail, both technically and in terms of design, and include comprehensive information. The guide must primarily reflect a design language that aligns with the institution's identity and should be detailed with consideration of all university campuses. Furthermore, the design criteria, which include graphics, illustrations, maps, plans, sketches, colors, the form and format of the signs, materials, fonts and font families, font sizes, spacing, and color choices, should be addressed as a whole and should meet both functional and aesthetic requirements.

In this context, as part of this thesis, a "Wayfinding System Guide" has been developed for both interior and exterior spaces aimed at improving the wayfinding systems of universities in Turkey, particularly in Istanbul. Comparisons have been made using visual examples from Istanbul Technical University's (İ.T.Ü.) informational designs, and solutions to identified deficiencies have been explained alongside the provided designs. In the fourth chapter, the wayfinding systems of two foundation and two public universities in Turkey have been classified based on research and studies. The shortcomings of the wayfinding systems of selected Turkish and foreign universities, taken as model examples, have been clearly identified using visual comparisons.

Figure 9: Comparisons Between the Design and Previous Examples Associated with İ.T.Ü.

5. CONCLUSION

In today's world, accessing information has become much easier due to advanced technological capabilities. Consequently, within the growing density of information, the field of "information design" has emerged, aiming to process raw data and transform it into a form that the target audience can easily comprehend. Due to its communication function, legibility and readability in typography should be prioritized, and the communication process should never lose clarity. One of the primary elements of graphic communication, typography's main function is to be "read." A typographic design that is perceivable and readable fulfills its function as a communication tool. Readability varies according to the application of rules such as spacing, line length, and reading time. Typography is the most critical element of any information design. In typographic arrangements used in information design, readability and clarity should be established by selecting typefaces, the space in which they are used, distance, and the message to be conveyed. Additionally, legibility is not solely about the readability of the typeface. Elements such as margins, columns, material selection, and color also affect legibility. Readers should be able to perceive written information with minimal effort and difficulty. To ensure readability in information design, typographic design must be crafted to be more attractive, exciting, and creative in tone, with a stronger sense of color and space, thereby enhancing its legibility.

It is recommended that national-level guides be prepared for different environments-such as universities, airports, hospitals, and metro systems-that teams working on information design can use to follow a more informed process during the project development stage. Within the scope of this thesis, a Wayfinding and Signage System guide, consisting of two parts-interior and exterior signage systems-has been created specifically for universities. Through this guide, it will be possible to improve the existing wayfinding systems on university campuses. This study will also serve as an example for conducting similar work in other environments.

The following conclusions have been reached through this study:

Based on the research and analyses conducted, it has been observed that the design elements comprising the wayfinding, informational, and signage systems in university campuses-such as the forms and shapes of directional and informational signs, symbols, text, and colors-used in the studied Turkish university campuses do not possess striking or original forms and visuals. There are issues with the selection of areas where informational design elements are placed on campuses. One of the most notable problems is whether the informational design elements on university campuses are perceivable and legible from long distances.

It was also found that the informational design elements on university campuses do not always function effectively in conveying information in a comprehensible and functional manner, leading to problems. Additionally, the lack of wayfinding and informational designs on campuses means that the necessary information is often inaccessible.

The design elements that constitute the wayfinding, informational, and signage systems on university campuses do not achieve visual coherence. Moreover, the number of informational and directional design elements on university campuses is insufficient, and their trackability is limited. For disabled individuals, symbols, signs, and colors used on campuses are limited in assisting them in navigating turnstile access, entrances and exits, and elevators to reach their destinations.

Symbols (elevator signs, turnstile signs, entrance and exit signs), text (building identification names, stop and street signs), and colors (safety signs, faculty colors, elevators) used across all campuses do not feature attention-grabbing designs.

Despite the existence of institutional identity guidelines in some universities, it was found that there are no standardized wayfinding and signage guides created with a design language that aligns with these institutional identities. Even when institutional colors are used, the colors selected during the design process for backgrounds and design elements do not always attract users' attention, and environmental factors were not considered in these designs.

There are significant differences in the design elements used in the wayfinding, informational, and signage systems between public and private university campuses, and the differences generally favor private universities.

As a result, an exemplary model was developed based on the Istanbul Technical University (ITU) sampling. The design employed institutional colors and the selected "DIN" font family, carefully incorporating font weights, font sizes, and precise spacing between letters, words, and lines. This led to the creation of an effective and functional design model. The wayfinding and informational signs within the design are easy to read and understand, thanks to the proper selection of typographic and graphic elements.

Based on the research data and findings, several recommendations were made for practitioners. Informational graphics should be used in appropriate locations and in sufficient numbers to facilitate easier communication for users within university campuses.

Additionally, it is crucial to establish a sense of institutional identity. The design should best represent the institution's identity by ensuring visual cohesion in its colors, forms, and font family.

Informational designers should prioritize clarity, comprehensibility, and originality in their designs, with typographic elements playing a key role in achieving these qualities.

Campus maps are particularly important and should be placed in high-traffic areas to assist users in finding their way. Directional signs are another critical design element for wayfinding.

Informational designs, especially at public transportation points and entrances/exits, are vital for providing guidance and information to visitors.

The continuity of visual unity should be maintained across all design elements through the consistent use of colors, shapes, pictograms, and text.

Just as the university campuses studied in this research require institutional identity designs, they should also have wayfinding, informational, and signage system guidelines for both interior and exterior spaces.

The successful design outcomes from the model developed for Istanbul Technical University highlight key design principles that should be considered for all public and private universities in Turkey, making this model a valuable example of effective design.

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