

VOL 7  
FALL/WINTER  
2023

# Design Behaviors

INTERNATIONAL DESIGN RESEARCH JOURNAL

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# Service Design Analysis of Urban Park Signage System - The Case Study of Namsan Park in Seoul

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## ABSTRACT

*This study explores the optimization of urban park signage design using service design concepts to enhance park service experience and citizen participation, using Namsan Park in Seoul as a case study. The research utilizes a literature review and qualitative research methods, including on-site observation, user surveys, and interviews. By applying the theories and methods of service design, the study identifies the characteristics of service design and its intrinsic connection with the urban park signage system. Furthermore, the study conducts actual surveys and user interviews in Seoul's Namsan Park to understand the needs and evaluations of the signage system by park users. The scope of the research is the Namsan Park signage system, which includes the analysis of user behavior, the park signage system's visual elements, brand flexibility, and identity, as well as user experience analysis. Based on the findings, the study offers design guidance for the Namsan Park signage system, as well as for city park signage systems. Overall, incorporating service design concepts into urban park signage design can optimize the design and further enhance park service experience and citizen participation. Thus, it provides an important reference for improving the design of the signage system of Seoul's Namsan Park. The hypothesis of an urban park signage design method based on service design is proposed.*

## KEYWORDS

Signage Design, Service Design, Urban Park, User Experience, User Satisfaction

## INTRODUCTION

In recent years, the phenomenon of the New Normal has been expanding, with many believing that changes in daily and social life triggered by climate change and especially COVID-19 will become the new norm, and the need for municipal parks and green spaces is increasing, while their value and function are being rediscovered. The area of parks in Korea is constantly increasing, and the number of visitors to national parks is also increasing. However, with the rapid development of society and the acceleration of urbanization, urban park construction is facing a series of challenges. The public's demand for urban parks is becoming more and more diversified and personalized, and they have higher expectations for the facilities and services provided by urban parks. As an important component of urban park facilities and services, the urban park signage system contributes to the brand image and character of the park. It plays an important role in enhancing visitor interaction, facilitating navigation, and creating a unified and pleasant park environment. To better serve visitors and cater to the actual needs of the public, the concept of service design needs to be effectively applied in the design of urban park signage systems.

Namsan is a representative landscape and park in the center of Seoul, which has changed with the history of Seoul, and is a space with a complex intertwining of multiple functions, such as tourism, rest, exercise, conferences, and education, among other uses. It is renowned for its unique location, rich cultural and historical values, diverse walking and hiking paths, and natural environment. Because of its location in the center of Seoul, its signage system is subject to various challenges of the urban environment, such as high pedestrian traffic, cultural diversity, and transportation and navigation needs. As an open park, Namsan Park facilitates opportunities for field observations, user surveys, and interviews to understand the needs and feedback of citizens and visitors. These distinctive features have established Namsan Park as a highly popular recreational destination for both Seoul residents and visitors alike, drawing a substantial number of visitors. Therefore, the purpose of this study, using Seoul's Namsan Park as a case study, is to conduct an in-depth exploration of service design their impact on urban park signage systems. The aim is to enhance and optimize the signage system design in urban parks, ultimately improving the park service experience and citizen participation. This research intends to provide valuable insights for enhancing the quality and effectiveness of urban parks while promoting environmental sustainability within the urban landscape.

Regarding the research methodology, Firstly, it will employ a literature

analysis method to review and compile relevant literature pertaining to service design thinking and urban park signage system design. This review aims to establish a comprehensive understanding of the inherent relationship between these two domains. Secondly, the study will conduct a detailed case study of Namsan Park in Seoul signage system, utilizing methods such as observational analysis, user research, and interviews. This investigation seeks to discern the specific needs and assessments of park visitors regarding Namsan Park's signage system, ultimately providing a valuable foundation and recommendations for enhancing the signage system within the park.

Namsan Park in Seoul, as the chosen case study, holds significant research potential in the context of service design for urban park signage systems. It presents an opportunity to optimize the service experience within urban parks, thereby contributing to the sustainable development of such urban park environments.

## LITERATURE REVIEW

### Service Design

Service design is a user-centered design approach that aims to provide users with excellent service through a deep understanding of user needs and experiences. (Wetter Edman, 2011). Service design may be described as a service-specific application of design thinking and has the following definition: 'Designed offerings to provide experiences that happen over time and across different touch-points' (Clatworthy, 2012). It suggests that what an organization designs and proposes to customers are offerings that are accessed through touch-points along a timeline, and that through use, provide desired experiential outcomes. Therefore touch-points are the key to service design. (Clatworthy, 2017). Prof. Albert Young Choi (2018) also has an in-depth study on touch-points design in his book *Culture Code Brand Design Methodology*, mentioning the need to systematically construct brand touchpoint design for consumers to actually experience, so that the brand can confirm its identity in the fierce market. Service design and brand design are intertwined and together they build the relationship between users and organizations. They can create a profound experience for users and build a solid brand image that reflects the essence of user-centered service design (Gloppen, 2012; Kimbell, 2009). Through the compilation and understanding of literature related to service design, the urban park signage system is treated as a visitor-centered, that focuses on visitors' emotional ex-

perience service design, and creates the value of using the urban park signage system through the interaction between visitors and the contact point (signage system).

### Urban Park Signage System

Campbell et al. (2021) state that one of the most noticeable ways that the “ideal park subject” is produced is through signage that directs people’s behavior in, interactions with, and perceptions of parkland. It is clear that signage system plays a vital role in parks, not only in providing information and guidance, but also in creating a park experience for visitors through interactive design and visual communication, leading to better enjoyment of the park’s services and activities. Cook (2013) outlined four overall functional systems for signs: locating (e.g., house numbers), informing (e.g., opening hours), controlling movement and behavior (e.g., no parking, no smoking), and service signs (e.g., fire hydrant signs). Within the framework of functional systems, the introduction of flexible systems and identity systems is recommended. Incorporating flexible systems and identity systems within the framework of signage systems presents several advantages within the context of urban park orientation design. Firstly, the integration of flexible systems enables effective updates to the orientation system, ensuring that visitors have access to accurate and pertinent information. This improvement significantly enhances the visitor experience and overall satisfaction. Secondly, the identity system contributes to creating a uniform and cohesive visual experience throughout the park, bolstering brand recognition, and the overall impact of the park’s brand and services.

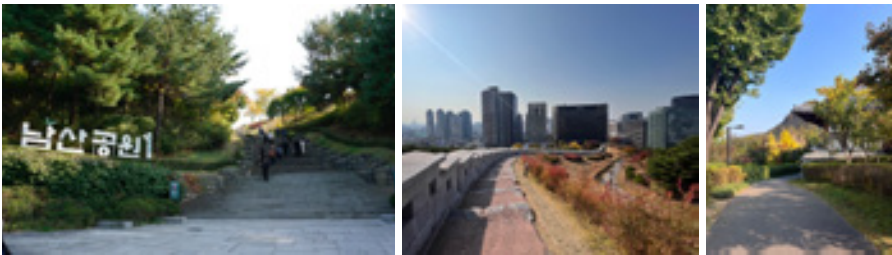
The primary objective of integrating service design into the urban park signage system is to offer visitors a high-quality user experience, efficient information dissemination, and a comprehensive guided tour service. Service design places a central emphasis on user needs, experiences, as well as the continuity and consistency of the service process. Therefore, within the context of urban park signage systems, design must be fundamentally user centric. It should deliver clear, easily comprehensible, and navigable guidance to assist visitors in comprehending the park’s layout, facilities, and services, thereby enhancing their overall park experience. Service design often employs visualization tools and storytelling techniques to communicate design concepts and user journeys. Within urban park signage systems, visual elements such as fonts, graphics, typography, and colors play a pivotal role in creating a visual experience. Additionally, these elements serve as a conduit for showcasing the park’s history,

culture, and unique features through compelling storytelling.

## SEOUL NAMSAN PARK SIGNAGE SYSTEM ANALYSIS

### Introduction of Namsan Park

Namsan is a symbol of Seoul, located in the center of Seoul, with a height of 265 meters above sea level, originally named Inkyungsan, but after King Taejo of the Joseon Dynasty moved the capital from Kaesong to Seoul in 1394, it was called “Namsan” because it is a mountain in the south, and it is an important mountain in Feng Shui. It was designated as a park on March 12, 1940, and opened on September 10, 1968, and for eight years from 1991, under the “Namsan Makeover” project, 89 negative facilities in the park were relocated and an outdoor botanical garden was created, and the entire area of Yejang-dong, Hoehyeon-dong, and Hannam-dong, Yongsan-gu was extensively restored and maintained, providing rest and fresh air to citizens and becoming a center for leisure life (Seoul Metropolitan Government, n.d.) (See Figure 1). Based on the background introduction to Namsan Park, we will focus on exploring the park’s signage system.



*Figure 1. Namsan Park (Author's own photograph)*

### Signage System Analysis

In alignment with the nature and target content of service design, we conducted a systematic analysis of the signage system within Namsan Park. This analysis encompassed various aspects, including signage layout and structure, information conveyance (text, graphics, color, typography, materials), flexibility, identity, and user experience.

Signage layout and structure: In a park signage system, the signage layout and structure can reflect the location of the signs, the way they are arranged, and the relationship between them. The elements of the layout and structure

of the signage system include the arrangement of the location of the signage, the number and density, the relevance to the attractions, and the hierarchical structure. The results of the analysis of the layout and structure of the signage in Namsan Park are shown in Table 1.

*Table 1. Signage layout and structure analysis*

Content	analysis
Location Arrangement	Directional signs, warning signs, and service signs are provided at park entrances and exits, major road intersections, around important attractions, around facilities (restrooms, parking lots, etc.), and in places with high visitor traffic.
Quantity and Density	The number of signage is high, which provide better service to visitors. However, the number and density of guide signs vary in different areas, and the number of guide signs in popular attraction areas is significantly more than other areas. Little to no signage in secluded areas and tree-lined paths.
Relevance to Attractions	Signage is closely associated with the attractions, and the signs around the attractions provide visitors with information on the names, distances, and directions to the attractions. It helps visitors to better understand the layout and location of attractions in the park.
Hierarchy	locating signs (e.g., house numbers), directional signs (e.g., arrow pointing), informational signs (e.g., opening hours), control action and behavior signs (e.g., no parking, no smoking), service signs (e.g., fire hydrant signs)

Information conveyance analysis: According to the categories of signs proposed by Cook (2013) (locating, informing, controlling movement and behavior, and service signs) combined with the results of the analysis of the layout and structure of the Namsan Park signage, the signs hierarchy was divided into five categories. They are locating signs, directional signs, informing signs, controlling movement and behavior signs (warning signs), and service signs. These five categories of guide signs are analyzed for information conveyance. The analysis is about the visual elements (text, graphics and Icons, color, layout, etc.) in the signage.

Text: A variety of sans serif fonts and one serif font appear in the signage system, and the font is not uniform enough and slightly complicated. The font in the overview map and directional signage is not highly recognizable. In some of the informational signs, the font size is small and not easy to read. Although four languages, Korean, English, Chinese and Japanese, appear in the overview map, not all text contents are presented in four languages. (See Figure 2).



Figure 2. Fonts sed in signage (Author’s own photograph)

Graphics and icons: Graphics and icons are mostly found in the overview map, namely the map and facility icons and public icons. The facility and public icons are appropriately sized, clear, and easy to recognize, and can accurately convey information (See Figure 2). In addition, the signage of Namsan Park Toddlers Forest Experience Center is mostly presented in the form of graphics, which are vivid, lively, and cute, such as animals and characters (See Figure 3).



Figure 3. The Signage of Namsan Park Toddlers Forest Experience Center (Author’s own photograph)

Color: The overall tone of the guide system is green, and the different green make the signage both uniform and layered. Green signage is more easily integrated with the natural environment in the park and are consistent with the overall style and atmosphere of the park. The text is white and light green, in unison with the overall color palette. Auxiliary colors are brown, yellow, red, and blue, mostly found in facility graphics and decorative graphics, which are complex and non-uniform, although the area used is not large. (See Figure 3).

Layout: The overall map of the overview map is left-right layout with the center axis (vertical) layout (See Table 2). The layout of directional signs text is left-aligned and right-aligned. Informing and warning signages are mostly center-axis (vertical) layout (See Table 2). There are differences in the layout of



guide signs for different functions, and the style is not uniform.

**Materials:** For the environmental friendliness and viewability of the signage, natural and durable materials are used for the Namsan Park signage. Hardwood is the main material, STS.PLATE bent, specified color powder coating as a supplement. The natural texture of the wood gives a warm and intimate feeling, which is in harmony with the surrounding natural environment, helps visitors to relax and enjoy the park environment, and increases the length of time and satisfaction of visitors staying in the park.

The specific applications about visual elements in different categories of signage are shown in Table 2.

**Flexible system and identity system:** A flexible system is the adaptability and versatility of signs and signage elements. So that the signage system can be easily adapted or updated according to different needs. Identity systems are used to establish a park's unique identity and brand image. to communicate the park's brand values and create a unique park image. The results of the analysis are shown in Table 3.

#### Visitor (Including tourists and citizens) Behavior Analysis

Because of the large area of Namsan Park, it was not possible to observe visitor behavior in various places in a short period of time. To observe and record the behavior of visitors at close range, Namsan Baekbeom Square was selected for visitor behavior analysis. Namsan Baekbeom Square is located near the main entrance of the park. It is surrounded by metro lines 1 and 4, a bus hub, tourist facilities, multiple entrances, and walking routes, and is one of the places with the largest tourist traffic (See Figure 2). The entrances and signage system can help visitors navigate the park and improve their experience. Tourist analysis at this location can help us understand visitor behavior and interaction with the facilities, optimize the signage system, better meet visitor needs, and provide a better experience. To facilitate recording and observation, a field research team was formed, consisting of four people. Each person chose an entrance/exit and a route to record and observe the behavior of visitors (See Figure 5, the lines different color represents different park routes). A systematic analysis of the signage system was conducted for this entrance and route. According to the data released by the Seoul Institute of City Development, the peak hours for visitors to Namsan Park are from 11:00 to 6:00 pm, and the peak hours for walking are during lunchtime. Therefore, the field survey time is from 11:00 am to 6:00 pm on non-holidays.

Table 2. Information conveyance analysis

Category	picture	Content		
Locating Signs		Text	Content	Facility Introduction, Contact Information
			Fonts	Sans Serif
		Color	Main color	Green (yellow-green, grass green, blue green)
			Secondary colors	Brown, Red, Yellow, Blue
		Graphics and icons	Graphic	Map of Namsan Park
			Icons	Facility Icons, Compass, Arrows
		Layout	Picture 1	Figure Left, Text Right, Left-Right Layout
			Picture 2,3	Central Axis (vertical)
Materials	Full	Hardwood, STS.PLATE bent, specified color powder coating		
Directional Signs		Text	Content	Names of Attractions, Distances (Korean, English, Chinese, and Japanese)
			Fonts	Sans Serif
		Color	Main color	Green
			Secondary colors	Yellow, Red
		Icons	Full	Arrows, Public Icons
		Layout	Picture 1,2	Left-aligned and Right-aligned
Materials	Full	Hardwood, STS.PLATE bent, specified color powder coating		
Informing Signs		Text	Content	Facility Introduction, Operating Hours
			Fonts	Sans Serif, Handwriting, Serif
		Color	Main color	Brown, Dark or Deep Green
			Secondary colors	Green, Yellow, Blue, Orange
		Graphics	Full	Pictures, Cartoon Graphics
		Layout	Picture 1,2	Asymmetry
			Picture 3	Central Axis (vertical)
Materials	Full	Hardwood, STS.PLATE bent, specified color powder coating		
Service Signs		Text	Fonts	Sans Serif
			Color	Main color
		Secondary colors		Yellow, Orange, Blue
		Graphics	Full	Cartoon Graphics
		Layout	Picture 1,2	Central Axis (vertical)
Materials	Full	Hardwood		

Table 3. Flexible system and identity system analysis







Flexible System		Identity System	
	<p>The map and service facility information in the overview map tour guide sign is flexible information. If there is a change in information, the signage needs to be recreated and it is not easy to adjust the weak flexibility.</p>		<p>A total of four different organizations' logos appear in the park's guidance system, and the identification system is weak and does not well reflect the brand identity of Namsan Park.</p>
	<p>Directional signage is installed by assembling the arrow guidance, text information together. The text message and directional guide as flexible information can be replaced partially to solve the problem if there is a mistake. High flexibility.</p>		<p>The main color is green, the tone is uniform, but the auxiliary color is too much color, which affects the brand unity and recognition.</p>
			<p>Text information uses a variety of fonts, affecting the brand recognition, a standard font and font size should be selected for uniform use. If the title is a font, the body is a font.</p>
			



Figure 4. Namsan Baekbeom Square (Author's own photograph)

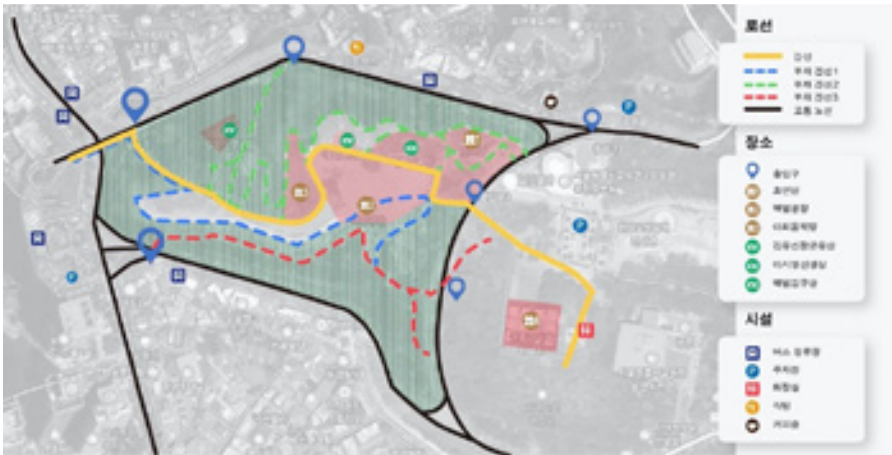


Figure 5. Observation roadmap (Author's own photograph)

The essence of service design is user-centered, and behavioral analysis of visitors can understand the characteristics and needs of visitors and improve service effectiveness. The analysis content is people flow, visitor audience, visitor activity behavior and the use of signage facilities. The analysis results are shown in Table 4.

Table 4. Visitor behavior analysis

	Route 1	Route 2	Route 3	Route 4
People Flow	most crowded route	Few people than route 1	Almost no one	Few people than route 2
Visitor Audience	From 11 a.m. to 5 p.m., it was mostly local middle-aged and elderly people, and fewer young people, and most of the young people who appear are foreign tourists or families with newborns. After 5 p.m., there are gradually more local young people, mostly unmarried lovers.			
Activity Behavior	Walking Chatting Resting Fitness Group activities-singing and recitation Photo shoot	Walking Chatting Picnic Photo shoot	Walking Chatting Photo shoot Resting	Walking Chatting
Signage Facilities Use	General use	Hardly used	General use	Low utilization rate

The results of the analysis show that: the number of visitors is low during non-holiday periods, and there are differences in the total number of visitors on different routes, with more visitors on route 1 and less on other routes. There are deviations in the activity behavior of visitors on different routes, and the usage rate of signage facilities is different. The main reason for this deviation and difference is that the facilities, spatial environment, and area of each route are different, and visitors also choose the route that suits them according to their personal preferences and needs. For example, Route 1 has a large number of signage, many attractions, a square, and a wide area more in line with the needs of middle-aged and elderly tourists to rest, chat, and group Activities, so Route 1 has more people and richer activity behavior. Route 3 has a parking lot and many related signage, and the use rate of guide signs is higher than that of Route 2 and Route 4. Thus, factors such as facilities (signage system) and environment are important factors affecting the number of visitors.

#### User research and interviews

Through the observation method of analysis, we obtain the actual behavioral data of tourists, but to understand the needs, experience, and feedback of tourists more fully, we conducted user research and interviews. The questionnaire method was used to conduct research on users (tourists), and the questionnaire content was mainly aimed at the user's basic, the basic situation of the use of the Namsan Park signage system, satisfaction, use experience and functional evaluation. The composition of the questionnaire content is shown in the table 5. The questionnaires were filled out by the interviewees on site and complexity issues were discussed in the form of interviews. The questionnaires were delivered on non-holiday days from 11:00 a.m. to 6:00 p.m. A total of 56 questionnaires were distributed, with 48 valid questionnaires, and the results of the questionnaires were analyzed for validity.

Analysis of findings: According to the statistical data on basic information of the total sample size, the highest percentage of the sample was 56.25% for those over 56 years old, 81.25% for women, and 69.91% for native Koreans. Users (tourists) use the signage system as shown in Figure 6, 43.75% of users (tourists) use the signage system occasionally when they visit the park and 18.75% of users (tourists) use the signage system almost every time, which is a low frequency of users (tourists) using the signage system as concluded from the research data. The main purpose of the users (tourists) who use the navigation system is to navigate to their destinations.

Table 5. Visitor behavior analysis

Questionnaire No.	Questionnaire Composition	Main content
Q1-Q3	Basic user information	Age, gender, place of residence
Q4-Q5	Basic situation of the use of the Namsan Park signage system	Frequency of use, purpose of use
Q6	Satisfaction	Overall satisfaction with the signage system, Satisfaction with the design of the signage system
Q7	Experience	Overall experience of using the signage system, ease of use, and the way information is presented
Q8-Q9	Functional evaluation	Map navigation function of the signage system, information accuracy, voice navigation and other functions

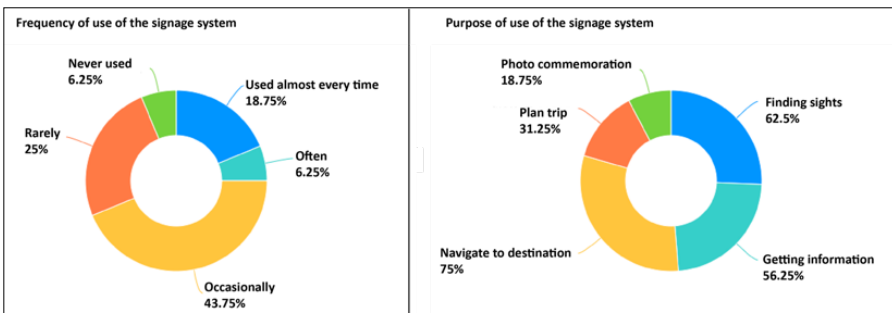


Figure 6. Basic situation of the use of the Namsan Park signage system (Author's own photograph)

56.25% of users (visitors) were moderately satisfied with the guide system, while 6.25% were dissatisfied, as shown in Figure 7. The ease of use and information presentation of the wayfinding system were positively evaluated overall, but some users encountered problems and difficulties in the process of using the system, and further improvements were needed to enhance the experience of using it (See Figure 7). Most of the users think that the signage system can meet the function of wayfinding, but the construction of multifunctional system is weak, such as voice navigation, real-time traffic information, etc., which should actively meet the multifunctional needs of users.

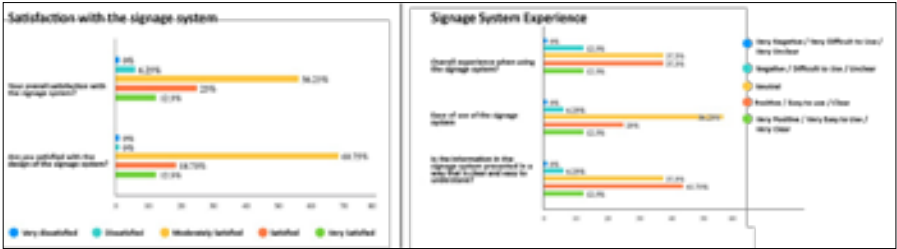


Figure 7. Satisfaction evaluation of signage system and evaluation of usage experience (Author's own photograph)

In the process of user research, there are some users (tourists) who have a lower evaluation of the satisfaction and experience of the signage system, for this user to conduct more in-depth research, the research takes the form of interviews, open questions (See Table 6), so that the user (tourists) can freely express their views on the signage system of Namsan Park.

Table 6. Interview questions

Questions No.	Questions
Q1	Have you encountered difficulties or problems in using the signage system?
Q2	Have there been any errors or misinformation when using the signage system?
Q3	Have you used other means of guiding around Namsan Park, such as paper maps or mobile phone apps? Which method do you prefer over the signage system? Why?
Q4	What factors do you think have influenced your user experience while using the signage system?
Q5	Where in your experience do you think the signage system needs to be improved? Do you have any suggestions about the design of the signage system?

The majority of users expressed satisfaction with the system's ease of use and the clarity of information presentation. However, some tourists raised concerns regarding the accuracy of the information, particularly the discrepancies between signage information and the navigation map. Among younger tourists, the directional guidance function was generally perceived as effective in directing them to their intended destinations. Nevertheless, they also voiced a desire for additional features, such as signage that allows photography, voice-guided navigation, and comprehensive attraction descriptions. Furthermore, our interviews revealed diverse preferences among tourists regarding navigation methods. The majority favored mobile phone-based navigation, followed by re-

liance on physical signage, while traditional paper maps were the least preferred option. Notably, some tourists found overview guide signage to offer a more intuitive and comprehensive guiding experience, making them a popular choice. Additionally, a subset of foreign tourists noted discrepancies in the design elements of the guide signs. User Experience: The primary factors influencing the visitor experience are as follows:

1) Several visitors have noted a significant disparity in the quantity and density of signage placement within the park. High-traffic areas are densely populated with signage, whereas low-traffic zones have minimal signage, leading to visitor uncertainty about their location.

2) The presence of diverse signage styles throughout Namsan Park can be confusing for external visitors, giving them the impression that they are not truly inside Namsan Park.

3) The accuracy of distance descriptions on signage could be enhanced, as there are occasional discrepancies compared to actual distances or mobile phone navigation data.

4) Some directional signage is positioned slightly lower in height, service-related signage, such as plant name markers, is placed too close to the ground. This necessitates visitors to bend down to view them, resulting in suboptimal visual aesthetics.

5) The brand identity system exhibits inconsistencies, including a wide array of fonts and secondary colors. Signage with identical functions showcases inconsistencies in appearance, leading to a lack of visual uniformity and cohesion. There is also a lack of signage suitable for souvenir photography.

6) The development of digital technology and application programs within the signage system is relatively underdeveloped, limiting the capability to provide visitors with a more immersive and personalized experience.

## DESIGN IMPROVEMENT RECOMMENDATIONS

Design Improvement Recommendations: Following a comprehensive assessment of the Namsan Park signage system, which included in-depth observation, visitor behavior analysis, user research, and interviews, a set of new design recommendations has been formulated. New design recommendations were developed to optimize the Namsan Park signage system in conjunction with service design thinking. These recommendations were developed to address the observed deficiencies, and the design recommendations aim to improving way-finding, brand recognition and visitor experience.



1) Sign locations and quantities are thoughtfully arranged to suit the park's size and complexity, ensuring coverage of essential attractions and facilities, including restrooms, parking lots, playgrounds, viewpoints, and path intersections, etc.

2) Implement regular reviews and updates of information displayed on the signage, such as distance measurements and location names. Utilize digital technologies like Global Positioning System (GPS) and internet connectivity to maintain the accuracy of this information.

3) Standardize the visual elements used in the signage system, encompassing aspects like layout, color, font, and graphic elements to establish a cohesive and recognizable brand image, enhancing visitors' perception and memory of the park.

3.1) Standardize the arrangement and combination of logos. Given the existence of multiple official logos in Namsan Park, a unified approach to arranging and combining these logos has been integrated to ensure brand identity consistency (See Figure 8). This creates an organized and cohesive visual image that enhances brand recognition and awareness.



Figure 8. Brand identity arrangement and combination (Author's own photograph)

3.2) Simplify the colors used in the existing signage system. Green serves as the predominant color in the visual signage system of Namsan Park, and numerous secondary colors have been incorporated into the existing signage, as depicted in Figure 9. It is advisable to maintain the original color palette while streamlining the use of secondary colors, as illustrated in Figure 10. Green is a happy color (Cimbalo et al., 1978), it is primarily associated with nature, trees, and vegetation (Hemphill, 1996), which often gives it a relaxing quality. Green can evoke people's associations with nature, resulting in a feeling of closeness to nature and relaxation. Create a positive and relaxed atmosphere to enhance

tourists' experience of the park. The auxiliary colors consist of yellow and red. Yellow can harmonize with green, providing a unified overall tone, while red can serve as a warning element. Red and green are complementary colors on the color wheel, which means that they are opposite each other. This complementary relationship creates a strong contrast between the two colors, which is why red is often used in warning signs to reinforce information through color contrast.

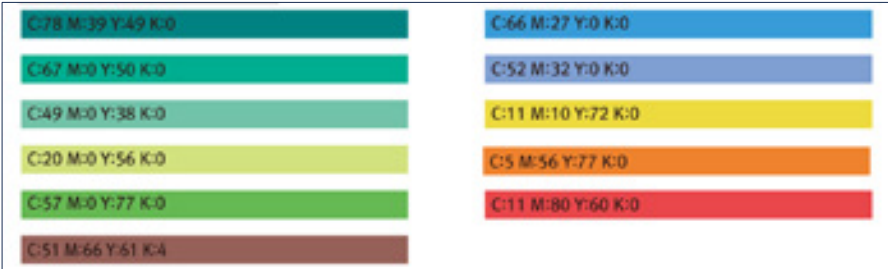


Figure 9. The use of color in existing signage systems (Author's own photograph)

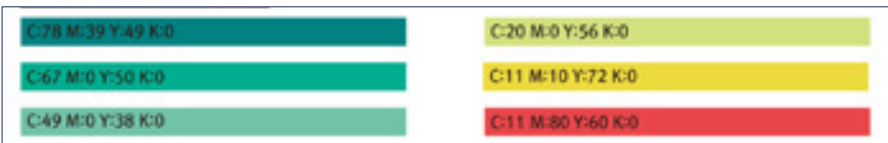


Figure 10. Redesigning the use of color in signage systems (Author's own photograph)

3.3) Unified fonts. There are four languages of Korean, English, Chinese and Japanese in the signage system, and four fonts are selected for different countries' language characters (See Figure 11). The four fonts are unified with sans serif fonts for easy reading. Korean language chooses Seoul Namsan font, it is a font designed specifically for the Namsan region of Seoul, Korea, and is used in publicity, logos, and design. With strong strokes and prominent bold design, it enables the text to catch the eye and have a strong visual impact in the design, while also showing the regional characteristics. English choose Helvetica font, Helvetica font spacing between letters and lines of uniform thickness, so that the text in different sizes and media can maintain good readability versatility and scalability, can be used flexibly according to different typographic needs. For example, is the use of the Helvetica font in the Swiss Federal Railways (SBB) signage system (See Figure 12). Chinese and Japanese choose Alibaba Puhui font, which has a simple and modern design style, with a

relatively bright form and intuitive line structure, high readability, supports 178 languages, and is a font that can be used commercially for free.



Figure 11. Korean, English, Chinese and Japanese font styles (Author's own photograph)



Figure 12. Styles Swiss Federal Railways (SBB) signage system (Source: <https://www.eguide.ch/en/objekt/sbb/>)

3.4) Establish a signage image that is natural, green, and readily identifiable. This can involve extracting elements from the park's flora and fauna and refining them into easily recognizable sign shapes and patterns. Ensure consistent usage of universal icons, enhancing recognition and memorability for visitors.

4) Given the potential for future park growth and expansion, it is imperative to enhance the flexibility of the signage system to ensure the accuracy and real-time relevance of signage information.

4.1) It is recommended to design a platform that allows easy updating and management of information. The backend management allows administrators to add, edit or delete information on guided tours, map data, and special events according to visitors' needs, and ensures that the guided tour information is

accurate and real-time.

4.2) Provide a mobile application for the signage system so that visitors can access the guided tour information on their own smartphones or tablets. This will provide greater flexibility and accuracy, allowing visitors to customize the experience on their device and receive real-time updates.

5) Adjust the height and position of signs based on ergonomic considerations and optimal viewing angles to improve visibility and readability.

5.1) The primary message of the signage should be positioned within the eye level range of an adult visitor, typically ranging from 5 feet (approximately 1.5 meters) to 6 feet (approximately 1.8 meters) in height. This height range ensures that the main signage message is easily visible and readable for adult visitors.

5.2) To cater to family visitors, supplementary information should be provided at a lower height to accommodate children. The height of children's signage should be determined based on the target age group, typically ranging from 3 to 12 years old. Considering the average height of this target age group, children's signage should be situated within a height range of 3 feet (approximately 0.9 meters) to 4 feet (approximately 1.2 meters). This range ensures that most school-age children can comfortably view and comprehend the information presented on the signage.

5.3) Signage for individuals with disabilities should be positioned according to the specific disability type and the requirements of wheelchair users. For wheelchair users, signage should be positioned within the reach of the user's arms and hands, with a recommended height range of 3 feet (approximately 0.9 meters) to 4 feet (approximately 1.2 meters). In the case of individuals with visual impairments, signage should be positioned at a moderate height to facilitate touch access, with a suitable height range of 3.5 feet (approximately 1.1 meters) to 4.5 feet (approximately 1.4 meters).

6) Integrate the signage system with sculptural art to captivate visitors' attention, enhance the park's overall visual allure and aesthetics, and elevate their overall visiting experience.

6.1) Sculpture-style signage, incorporating guiding information within a sculpture or statue, seamlessly integrating it into the signage system.

6.2) Seasonal embellishment, altering the sculpture's decoration to align with various seasons and infusing it with guide-related information.

6.3) Interactive sculptures, allowing visitors to obtain guide information by interacting with or manipulating the sculpture, thereby intensifying their sense of engagement and immersion in the park.

7) It is advisable to leverage digital technology to enhance the signage system, enabling features such as customized routes and delivering a more immersive, personalized park experience.

7.1) Consider designing interactive signage systems that empower visitors to tailor their tour experience. This could encompass personalized maps, point-of-interest markers, attraction suggestions, and route-planning tools to accommodate diverse visitor needs.

7.2) It is recommended to introduce a virtual tour guide functionality, accessible through augmented reality (AR) or audio-guided tours. This feature would enable tourists to select virtual guides who provide relevant attraction introductions and narrations tailored to individual tourist preferences.

7.3) Ensure multilingual support to accommodate visitors from various countries and regions. This can be achieved through the provision of multilingual text information and audio-guided tours.

## CONCLUSIONS

In this study, a comprehensive analysis of the Namsan Park signage system was undertaken. Through the observation of visitor behavior, user research, and interviews, it was established that the signage system plays a pivotal role in enhancing the visitor experience. The study results underscore the impact of user-centered service design thinking, uniformity, ease of use, accuracy, interactivity, and digitalization of the signage system on visitor satisfaction and experience. Furthermore, issues with the existing signage system at Namsan Park were identified. To further enhance visitor satisfaction and experience, design recommendations were proposed based on visitor feedback and service design principles. These design suggestions offer valuable insights for enhancing the Namsan Park signage system. It is recommended that the information update mechanism of the signage system be reinforced in the future, and that digital technology and art be leveraged to provide a personalized guided tour experience, thereby increasing the park's overall appeal. Ultimately, this study holds practical significance not only for Namsan Park but also offers valuable design guidance for signage systems in similar scenic areas or city parks. Future research could delve deeper into the relationship between service design, signage systems, and visitor experiences, as well as explore the unique requirements of signage systems in diverse cultural contexts.

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