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A Study on the Use of Experience Design Elements in Complex Cultural Spaces Utilizing Idle Industrial Facilities

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Abstract:

As the industrial structure of cities has significantly changed today, many idle industrial facilities, arising from the collapse of secondary industries such as manufacturing, are being repurposed into new spaces for modern cultural activities to align with the new industrial structure. With the improvement in living standards within these spaces, interest in culture has increased, leading to the rise of experiential and participatory cultural activities. In the era of the experience economy, complex cultural spaces that feature exhibitions, sales, performances, and experiences centered on culture and arts are increasingly emerging. This study aims to explore the application of experiential design in complex cultural spaces by analyzing the experiential design elements of both domestic and international cases, focusing on the accessibility of users and spatial dimensions. The spatial dimension of this study focuses on domestic and international cases of complex cultural spaces that repurpose idle industrial facilities. It examines the concepts, spatial compositions, and experiential design elements and characteristics of these spaces. By analyzing the experiential design elements in each case, this study assesses the characteristics in terms of user and spatial accessibility. The analysis results indicate that from the user's perspective, there is a need for utilizing various elements, as there is a strong focus on the materials and color contrasts of the space. In terms of interactivity, all four cases are composed of programs reflecting regional characteristics, resulting in monotonous forms of art and cultural activities. Most spaces are passive in terms of experiential engagement, highlighting the need for planning spaces that allow for active interactive experiences. Thus, from the user's perspective, it is necessary to enhance participatory and interactive experiences and to plan for genuine experiences through diversity and direct participation within the space. From the spatial perspective, while symbolic, historical, and open aspects are generally high, continuity, complexity, and variability experiences are relatively lacking and require improvement. This study presents the characteristics of experiential design elements in complex cultural spaces utilizing idle industrial facilities and identifies areas needing improvement based on their accessibility. Building on the results of this study, future research will aim to provide specific strategies for applying various unique experiential design elements to complex cultural spaces.

Keywords:

Complex cultural spaces; Idle industrial facilities; Experiential; Design elements; Utilizing

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1. Introduction

1.1 Research Background and Purpose

With significant changes in the industrial structure of cities today, the decline of secondary industries such as manufacturing has led to the emergence of numerous abandoned or old industrial facilities. These idle industrial facilities are being repurposed to align with the new industrial structure, transforming them into new resources. This process entails giving new characteristics to aged buildings, thereby fusing their existing architectural value with new functions to recreate unique spaces that retain historical and cultural memories (Kim & Kim, 2014). These revitalized spaces have evolved into areas for modern cultural activities. As living standards have improved, interest in culture has continuously increased, making value-centered cultural activities focused on experiences and engagement predominant (Kim, Noh, & Hwang, 2019).

In particular, in the era of the experience economy, people not only emphasize the production value of products but also assess the value of spaces based on experiential factors and service levels to meet their emotional needs. Complex cultural spaces that attempt to communicate with users through art and culture, providing valuable experiences and momentary enjoyment, have emerged, creating new forms of social consumption (Shim & Park, 2019). This study aims to provide foundational data for the construction of experiential design in complex cultural spaces by analyzing the experiential design elements of repurposed idle industrial facilities in terms of user and spatial dimensions.

1.2 Scope and Methods of the Study

The spatial scope of this study focuses on domestic and international complex cultural spaces that utilize idle industrial facilities. For the domestic examples, Art Bunker B39 in Bucheon and Palbok Art Factory in Jeonju have been selected. Internationally, LocHal in the Netherlands and IDDIS in Norway, which have recently seen active regeneration projects of idle industrial complexes, have been chosen. The research methodology involves theoretical considerations of complex cultural spaces and experiential design to derive experiential design elements and characteristics for complex cultural spaces. An analytical framework for case studies will be created, examining the experiential design in these spaces from both user and spatial dimensions to explore the necessity and activation strategies for experiential design in complex cultural spaces.

2. Complex Cultural Spaces and Experiential Design

2.1 Concept and Composition of Complex Cultural Spaces

Complex cultural spaces are designed to foster interactions with local residents by connecting various cultural and artistic contents, while simultaneously aiming for cultural production and economic revitalization (Park & Lee, 2018). The various functions within these spaces are not merely combined but are organically integrated by considering the interrelationships between functions to maximize the utilization of the space (Kim, Noh, & Hwang, 2019).

Additionally, complex cultural spaces that regenerate unused industrial facilities preserve historical industrial architectural styles and develop by harmoniously linking the local economy with the cultural industry (Liu

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& Chu, 2021). This ensures the cultural value of historical industrial buildings is maintained to the fullest extent while combining various cultural, artistic, and commercial functions. Ultimately, complex cultural spaces play the role of becoming representative cultural sites of the area, enriching the cultural significance of the space.

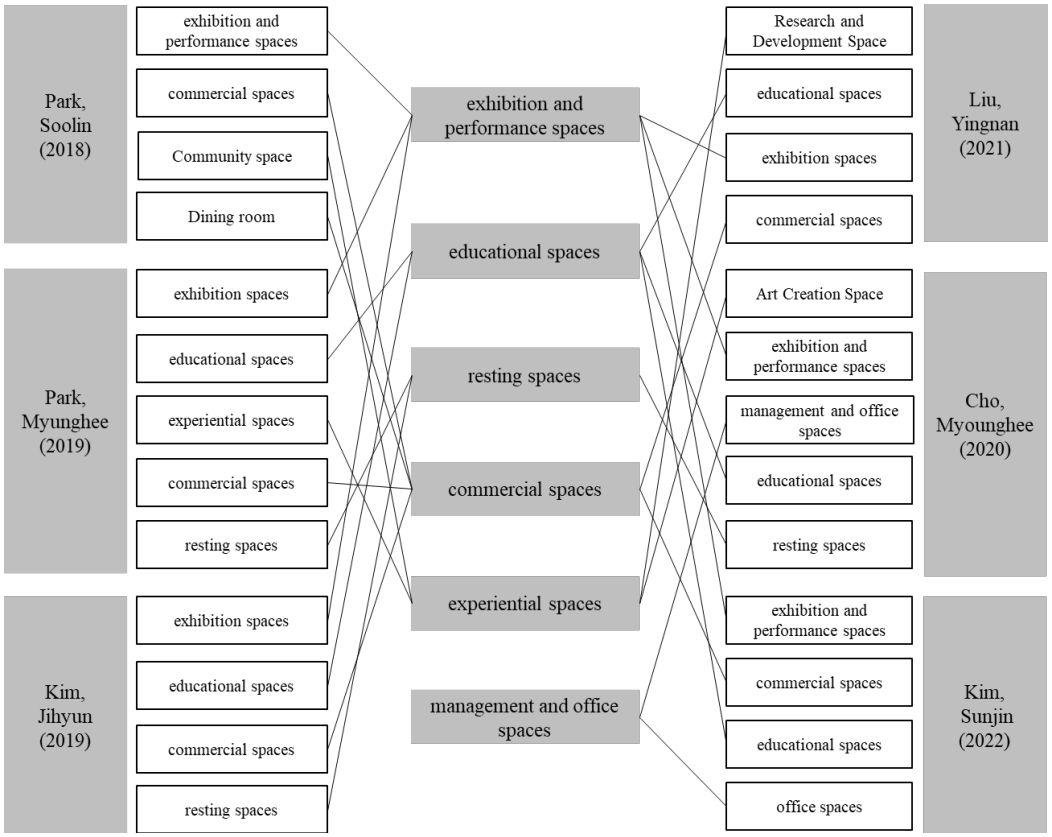


Fig. 1 Spatial Composition of a Complex Cultural Space

The composition of complex cultural spaces includes six types of spaces: exhibition and performance spaces, educational spaces, resting spaces, commercial spaces, experiential spaces, and management and office spaces, as summarized in <Figure 1>. The exhibition and performance spaces are for displaying products and viewing various art performances. Educational spaces are for experiencing various cultural and artistic education. Resting spaces are for taking a break and socializing. Commercial spaces are for various business activities such as cafes and restaurants. Experiential spaces are for activities like crafting, reading, and artistic experiences. Management and office spaces are defined as areas responsible for the operation of the complex's programs and the management of various facilities.

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Table 1 Conceptual Summary of Each Space Type

Space Type		a summary of the concept
S1	exhibition and performance spaces	A space where exhibitions and various artistic performances are held
S2	educational spaces	A space where various cultural and artistic education, such as cultural events and art classes, takes place
S3	resting spaces	A space for rest and interaction
S4	commercial spaces	A space where various business activities, including food and merchandise sales, are conducted
S5	experiential spaces	A space for various experiential activities, such as handicraft workshops, reading activities, and artistic endeavors
S6	management and office spaces	A space responsible for managing daily operations and various facilities

2.2 Elements and Characteristics of Experiential Design

In their book "The Experience Economy," B. Joseph Pine II and James H. Gilmore define experience as a beautiful feeling that one perceives when reaching a certain level of physical, intellectual, emotional, or even spiritual engagement (Joseph & James, 2011). Bernd H. Schmitt, an American expert in experiential marketing, proposed the "Strategic Experience Modules," which divide experiences into five types from a psychological perspective: sensory, emotional, cognitive, behavioral, and relational. He suggests that the characteristics of user experiences are determined by the combination of products and services obtained during the consumption process through specific experience modules and tools (Bernd, 2004). Experiential marketing differs from traditional marketing methods by focusing more on the customer's overall experience. While traditional marketing emphasizes the features and functions of products or services, experiential marketing focuses more on the consumer's emotions and feelings (Park & Yoon, 2012).

In complex cultural spaces, the user's overall experience includes all the feelings and thoughts they have while using the space's programs, products, and services. These experiences encompass both direct and indirect interactions. True user experience involves more than just providing what users want; it should enable them to interact with the space, participate, and gain valuable experiences (Kang, 2015).

Ultimately, from a theoretical perspective, experiences can be categorized into sensory, emotional, cognitive, behavioral, relational, and interactive aspects from the user's standpoint. Additionally, from a spatial dimension, experiences can be categorized into symbolism, temporality, accessibility, continuity, openness, variability, historicity, and complexity.

As a result of analyzing experiential elements, they were divided into user and spatial dimensions. The user dimension includes sensory and interactivity aspects, while the spatial dimension includes symbolism, historicity, openness, continuity, complexity, and variability, summarizing a total of eight aspects. Furthermore, the characteristics of experiential design elements in the space according to each experiential approach are summarized in <Table 2>.

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Table 2 Summary of Characteristics of Experience Design Elements

Experiential Design Elements			Characteristic
user dimension	Sensitivity	E1	Includes the distinctiveness and diversity of design elements that stimulate the senses, thereby reducing boredom.
	Interactivity	E2	Incorporates shared spaces that promote interaction among users, interactive spaces, and various cultural and artistic activity areas.
spatial dimension	Symbolism	E3	Symbolizes iconic elements such as logos and symbols, representing the landmark nature of the area.
	Historicity	E4	Recycles spaces and facilities containing historical significance into experiential spaces.
	Openness	E5	Features a high ratio of visual openness and glass finishes in windows and doors within indoor spaces.
	Continuity	E6	Exhibits a cohesive style and connectivity among spaces with diverse functions.
	Complexity	E7	Enhances spatial utilization by integrating spaces with complex functions related to culture, art, and commerce.
	Variability	E8	Provides flexible spaces that can adapt their functions according to user needs.

3. Case Analysis

3.1 Overview of Research Subjects

This study aims to identify the characteristics and elements of experiential design within complex cultural spaces created by repurposing unused industrial facilities, focusing on four such spaces both domestically and internationally. For domestic research sites, we conducted direct visits to Art Bunker B39 in Bucheon and Palbok Art Factory in Jeonju. For international research sites, we investigated and analyzed LocHal in the Netherlands and IDDIS in Norway through their websites. The overview of each research subject is summarized in <Table 3> below.

Table 3 Summary of investigation cases

Number	Name	Location	Before renovation
01	Art bunker B39/2018	Bucheon-si, Gyeonggi-do, South Korea	A garbage dump
02	Palbok Art Factory/2018	Jeonju City, North Jeolla Province, South Korea	cassette tape factory
03	LocHal/2018	Tirburg, Netherlands	the lobby of a train station
04	IDDIS/2021	Stavanger, Norway	a canning factory

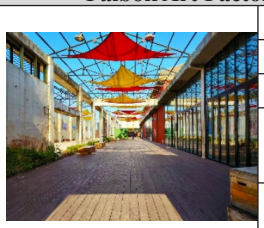
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3.2 Case analysis

Table 4 Analysis of Experience Design Elements in Art Bunker B39

01	Art bunker B39					
					Size	2 storeys
					Area	3,304 ㎡
					Opening year	2018
					Before renovation	A garbage dump
					After conversion	A complex cultural space
Space Type						
S1	S2	S3	S4	S5	S6	
4	0	2	1	4	2	
Experience Design Elements						
user dimension	E1	•The roughness of the space is accentuated by retaining the original cement color of the existing building.				
	E2	•It hosts related exhibitions and experiential events, such as Hanbok art exhibitions and film festivals. •Interaction with users is facilitated through experiences like watching films with VR devices and shadow installation art.				
spatial dimension	E3	•The logo of 'B39,' symbolic of the space, can be found throughout. •It serves as a representative multi-cultural space for the regeneration of Bucheon City.				
	E4	•Facilities such as the manned air-blowing room, grain control room, and central control room are preserved within the space. •The existing waste treatment facilities have also been preserved." •The concrete walls and piping of the original building have been preserved to the greatest extent possible.				
	E5	•Openness of the space is enhanced through the use of atriums, windows, and glass walls.				
	E6	•The functions of each space are interconnected, and the design styles are harmonized.				
	E7	The functions of exhibition spaces and cafes are integrated.				
	E8	•The expansive layout of the space allows for diverse artistic and cultural activities to take place. •Numerous studio spaces meet the diverse experiential needs of users.				

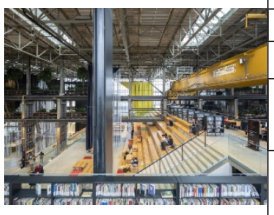
Table 5 Analysis of Experience Design Elements in Palbok Art Factory

02	Palbok Art Factory					
					Size	3 storeys
					Area	2,714 ㎡
					Opening year	2017
					Before renovation	cassette tape factory
					After conversion	Complex cultural space
Space Type						
S1	S2	S3	S4	S5	S6	
4	1	2	1	1	4	
Experience Design Elements						

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user dimension	E1	•The exterior walls are decorated with paint in colors such as red, yellow, and green. •Large amounts of graffiti are preserved on the exterior walls and floors.
	E2	•The interior features spaces such as an exhibition hall and the Ipnap Tree Picture Book Library. •Outdoor spaces, including the Children's Art Playground and the Ipnap Tree Plaza, offer play and experiential facilities that interact with users.
spatial dimension	E3	•The logo symbolizing the Palbok Art Factory is found throughout the space. •It has established itself as a representative multi-cultural space in the region."
	E4	•Most of the existing facilities and structures have been repurposed into outdoor play spaces for children. •The structure, graffiti, and facilities of the original building, symbolizing the space's history, have been preserved." •The steel pipe structure of the original factory ceiling has been preserved intact.
	E5	•Large windows connect the indoor and outdoor spaces.
	E6	•Buildings are connected through container walkways.
	E7	•The exhibition spaces are integrated with functions such as the picture book library and a café.
	E8	•Space is reserved within the factory building for various artistic and cultural activities.

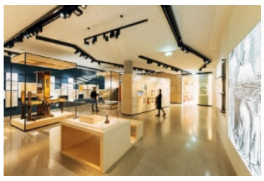
Table 6 Analysis of Experience Design Elements in LocHal

03		**LocHal**			
				Size	3 storeys
				Area	7,000 ㎡
				Opening year	2018
				Before renovation	the lobby of a train station
				After conversion	A complex cultural space
Space Type					
S1	S2	S3	S4	S5	S6
3	2	3	1	6	2
Experience Design Elements					
user dimension	E1	•The existing monotone steel structure contrasts with the furniture colors of red, yellow, and blue. •The high ceilings of the original structure create a visually stimulating experience for users.			
	E2	•Various experiential spaces, such as a digital lab, studio, and future lab, are provided. •Interaction with users is fostered through experiential programs such as 3D printing, video recording, and gaming experiences. •The children's reading room captures interest with bookshelves shaped like pencils and rulers.			

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spatial dimension	E3	•It has been transformed into a library representing the region by preserving various railway-related elements.
	E4	•The steel structure of the original train station lobby has been repurposed as is. •Historic elements, such as railway tracks and desks made from train wheels, have been preserved.
	E5	•The extensive use of glass and steel on the building façade enhances the sense of openness. •The space is largely open with minimal interior partitions.
	E6	•The space harmoniously integrates a 'newtro' (new retro) style with modern design elements.
	E7	•It serves as a multifunctional space that includes a café, studio, and offices.
	E8	•Movable tables and flexible fabric curtain walls make the space easy to use.

Table 7 Analysis of Experience Design Elements in IDDIS

04	IDDIS	
  	Size	3 storeys
	Area	1,600 ㎡
	Opening year	2021
	Before renovation	a canning factory
	After conversion	A complex cultural space

Space Type					
S1	S2	S3	S4	S5	S6
3	0	2	1	1	2

Experience Design Elements		
user dimension	E1	•The building's exterior combines red brick with glass. •The glass walls are decorated with alphabetic characters, visually engaging the visitors.
	E2	•The exhibition space encourages user participation through exhibits arranged in chronological order. •The smokehouse studio facilitates interaction and exchange among users through meat smoking and tasting experiences.
spatial dimension	E3	•The building employs the iconic Stavangar traditional architectural style, with white walls and a red roof.
	E4	•The chimney and facilities related to canned food production from the original canning factory have been preserved.
	E5	•The extension of the building features glass façades, offering consumers an unobstructed view. •The ground floor connects to the outdoor garden through floor-to-ceiling glass walls.
	E6	•The extension and the original building are connected by a glass corridor.
	E7	•Spaces for coffee and performances are integrated around the exhibition area. •The functions of the Canning Museum and Printing Museum are combined.
	E8	•The outdoor garden provides a flexible space for various cultural activities and artistic performances.

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3.3 Summary

Table 8 Analysis of Spatial Configuration by Case

Type Case	S1	S2	S3	S4	S5	S6
01	4	0	2	1	4	2
02	4	1	2	1	1	4
03	3	2	3	1	6	2
04	3	0	2	1	1	2

The composition of complex cultural spaces is broadly divided into six types of spaces. Upon examining the number of planned spaces in four domestic and international complex cultural spaces that repurpose unused industrial facilities, it was found that all four cases had more than two exhibition and performance spaces, resting spaces, and management and office spaces. This ensures the smooth operation of complex cultural spaces by equipping them with necessary infrastructure such as exhibition, management, and resting facilities. Additionally, despite some differences in area between domestic and international cases, even the smallest area, 04 (IDDIS, Norway), included exhibition/performance spaces, resting spaces, and management and office spaces. Secondly, commercial spaces were found to be relatively simple, typically consisting of food and beverage areas like cafes. Thirdly, in cases 02 and 04, there was only one experiential space where users could have unique experiences through participation and interaction, indicating a lack of interaction between people and spaces and a deficiency in spatial experiences. Generally, experiential spaces refer to areas like artists' studios and workshops where users can have unique experiences through participation and interaction. In summary, the analysis indicates that there is a need to supplement commercial, experiential, and educational spaces to enhance the functionality and diversity of complex cultural spaces.

The experiential design elements of complex cultural spaces were analyzed by dividing them into user dimensions and spatial dimensions. Analyzing the user dimension experiential elements of the four complex cultural spaces revealed the following: First, to provide sensory experiences, cases 02, 03, and 04 primarily used contrasts in color and materials. However, since the focus was mainly on materials and color contrasts, a more diverse use of elements is needed. Secondly, in terms of interactivity from the user dimension, the programs in each case were composed of local features, indicating that the forms of artistic and cultural activities were monotonous. Therefore, a variety of programs that allow for participation are necessary, and since many spaces were found to be for passive experiences, planning for spaces that enable active interactive experiences is required. Ultimately, it was found that there was a lack of true experiences that users could gain through direct participation. Therefore, it is necessary to strengthen participation and interactive experiences from the user dimension and plan for true experiences through direct participation and diversity within the space.

Analyzing the spatial dimension experiential elements revealed the following: First, while cases 01, 02, and 04 had high symbolic value, case 03, despite repurposing the original facilities, lacked spaces that could symbolize old history and culture, such as exhibitions. Secondly, in all four cases, the historical value was sufficiently expressed through the preservation of existing buildings. Thirdly, all four cases utilized windows, atriums, and entrances to connect with the outside and enhance the openness of indoor spaces. However, in case 01, the closed exterior of the existing building was used as it was, leading to a relatively monotonous

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form with openness only from the inside. Fourthly, all four cases were found to lack continuity in spatial experiences. Specifically, in cases 01 and 02, although there was a visual sense of unity through the monotonous form of the space, the continuity of experiences provided by color, materials, and content within the space was found to be lacking. Fifthly, all four cases were somewhat lacking in complex experiential design. Most cases only included functions of cafes and exhibitions, leading to low utilization and monotonous spatial functions. Lastly, cases 01 and 03 had sufficient flexible spaces. This was facilitated by the use of easily movable fabric curtains and movable furniture, making it easy to change the function of the space.

4. Conclusion

This study examined the characteristics of accessibility in experiential design within complex cultural spaces utilizing unused industrial facilities from both user and spatial dimensions. In the investigated cases, the integration of various functional spaces such as exhibition/performance spaces, educational spaces, experiential spaces, and commercial spaces, along with the use of local culture, created diverse experiential content centered around cultural and artistic spaces. By respecting the cultural differences of the regions where they were located and creating unique spatial contexts, the sustainable development of complex cultural spaces was promoted. However, in terms of experiential design elements from the user's perspective, it was found that more diverse elements beyond materials and colors are needed to provide sensory experiences. There is also a need for varied content instead of programs focused solely on local arts and cultural activities, and for spaces planned to allow for active interactive experiences. From the spatial dimension, while experiential elements such as symbolism, historicity, and openness were generally high, continuity, complexity, and variability in experiences were relatively lacking. Therefore, for complex cultural spaces planned using unused industrial facilities, improvements in these areas are necessary.

In summary, this study highlighted the characteristics of accessibility in experiential design elements within complex cultural spaces utilizing unused industrial facilities and suggested areas for improvement. Based on the results of this study, future research aims to specifically propose ways to apply diverse and distinctive experiential design elements in complex cultural spaces.

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