Research Article

Evaluation of the Regeneration Value of Industrial Heritage: A Case Study of Nanchang 699 Cultural and Creative Park, Jiangxi

การประเมินมูลค่าการฟื้นฟูมรดกทางอุตสาหกรรม: กรณีศึกษาสวนวัฒนธรรมและความคิดสร้างสรรค์หนานชาง 699 มณฑลเจียงซี

Mingyuan Zhang[1]

Supachai Areerungrueng[2]

Article History

Received: November 1, 2022

Revised: June 14, 2023

Accepted: June 16, 2023

Abstract

With the advancement of science and technology and the fast progress of industrial clusters. Early in the 1990s, the lagging industrial development gradually lost its ability to compete, which resulted in bankruptcy. As a result, many older industrial factories have been left unused, and the concentrated factories' culture has become precious collective memory in people's hearts. Recycling industrial heritage in concentrated factories is crucially essential for local ecological development. Many industrial waste materials in industrial heritages, such as stone, wood, metal, and glass, are mostly non-renewable resources. In order to reasonably utilize non-renewable resources, it is necessary to revive the lives of Industrial heritage, explore the combination of ecologically sustainable development and economic development, scientifically and rationally carry out the

[1]Faculty of Decorative Arts, Silpakorn University

E-mail: 328816326@qq.com

[2]Faculty of Decoratine Arts, Silpakorn University,

E-mail: areerungruang_s@silpakorn.edu

transformation of industrial buildings and the artistic processing of industrial waste materials to form a new subject with commercial value. Through a systematic study on the evaluation of the regeneration value of industrial heritage, the thesis constructs a scientific and complete theoretical framework for the value evaluation of the Nanchang 699 Cultural and Creative Park in Jiangxi. The research results show that the commercial value of 699 Cultural and Creative Park is slightly more significant than the original value of both internal and external conditions. Nevertheless, commercial value is realized based on the original ontological value of the factories, such as historical background, cultural heritage, environmental structure, and the flow of people in residential areas, which are interdependent and influence each other. By comparing the weights of the evaluation system and analyzing the results, the study provides a scientific basis for the development direction and strategy of industrial heritage regeneration.

Keywords: *Industrial Heritage, Old Buildings, Waste Materials, Value Evaluation*

บทคัดย่อ

จากความล้ำสมัยของวิทยาศาสตร์และเทคโนโลยีรวมถึงความก้าวหน้าแบบก้าวกระโดดของวงการอุตสาหกรรม ทำให้การพัฒนาอุตสาหกรรมในอดีตที่กว้างขวางมีการสูญเสียความสามารถในการแข่งขันลงทีละน้อยในช่วงต้น ปี1990 และต้องเผชิญกับการล้มละลายและปิดกิจการลง ผลลัพธ์จากสภาวะดังกล่าวคือโรงงานอุตสาหกรรมเก่าจำนวนมากถูกปล่อยทิ้งร้างไม่มีการใช้งานและต่อมาศูนย์รวมวัฒนธรรมโรงงานกลายเป็นที่สะสมความทรงจำอันล้ำค่าของผู้คน ซึ่งการรีไซเคิลมรดกทางอุตสาหกรรมในศูนย์รวมโรงงานจึงมีความสำคัญต่อการพัฒนาระบบนิเวศอย่างยิ่ง เมื่อพิจารณาขยะที่เหลือเป็นมรดกในพื้นที่โรงงาน เช่น หิน ไม้ โลหะ แก้ว ล้วนเป็นทรัพยากรที่ไม่สามารถหมุนเวียนกลับมาใช้ใหม่ เพื่อให้เกิดการนำทรัพยากรเหล่านี้มาใช้อย่างสมเหตุสมผล จึงจำเป็นต้องมีการฟื้นฟูสภาพมรดกทางอุตสาหกรรมขึ้นมาใหม่ ผ่านการสำรวจที่ผสมผสานระหว่างการพัฒนาที่ยั่งยืนและการพัฒนาเศรษฐกิจด้านระบบนิเวศ การดำเนินการดัดแปลงอาคารอุตสาหกรรมและใช้กระบวนกาทางศิลปะจัดการเหล่าวัสดุขยะจากอุตสาหกรรมอย่างมีหลักกา และสมเหตุสมผลเพื่อรังสรรเป็นสิ่งของใหม่ที่มีมูลค่าเชิงพาณิชย์ ด้วยการวิจัยเชิงระบบที่ศึกษาเกี่ยวกับการประเมินการฟื้นฟูมรดกทางอุตสาหกรรม วิทยานิพนธ์ชิ้นนี้ได้ดำเนินการศึกษาตามหลักการและภายใต้แนวคิดทฤษฎีสำหรับการประเมินมูลค่าของสวนหนานชาง 699 สวนวัฒนธรรมและเสริมความคิดสร้างสรรค์ในมณฑลเจียงซี ผลจากการศึกษาแสดงให้เห็นว่ามูลค่าเชิงพาณิชย์ของสวนหนานชาง 699 มีสูงกว่ามูลค่าเดิมเล็กน้อยทั้งสภาพภายในและภายนอก อย่างไรก็ตาม การสร้างมูลค่าเชิงพาณิชย์นั้นขึ้นอยู่กับมูลค่าในสภาพดั้งเดิมก่อนหน้าของโรงงานเหล่านั้น เช่น ความเป็นมาทางประวัติศาสตร์ ความเป้นมรดกทางวัฒนธรรม สภาพโครงสร้างทางสิ่งแวดล้อม รวมถึงการหนาแน่นของผู้คนพื้นที่พักอาศัยซึ่งล้วนพึ่งพาอาศัยกันและมีอิทธิพลต่อกัน นากการเปรียบเทียบค่าน้ำหนัก

จากระบบการประเมินและการวิเคราะห์ผล พบว่า ผลการศึกษามีนัยสำคัญที่ส่งผลต่อการกำหนดทิศทางและกลยุทธ์การพัฒนา

คำสำคัญ: *มรดกทางอุตสาหกรรม ตึกเก่า วัสดุเหลือใช้ ประเมินมูลค่า*

Introduction

The protection of cultural relics has always been a global problem, and the protection of industrial heritage is also facing a dilemm. At the same time, there are a series of problems in China's industrial heritage protection, such as incomplete overall planning, homogenization of commercialization, and severe cultural disruption (Chemat et al, 2017). At the same time, there are a series of problems in China's industrial heritage protection, such as a lagging overall concept, an incomplete standard system, a single economic supply, prominent emerging industries, and complex social problem (Carvalho et al., 2021). If the historical and cultural value can be preserved, the problems of integrity and style may be reduced.

The economic value of industrial heritage can play an essential role in the economic revitalization of declining urban areas and maintain the continuity of regional vitality (Osman & Farahat, 2018). Economic value better explains the differences between historical sites and commercial institutions and proves that economic value requires embedded commercial groups and requires commercial groups to protect industrial site (Freeman, 2001). If the regeneration of industrial sites can provide people with re-employment opportunities and bring commercial recovery to abandoned industrial areas, it can prove that industrial sites have commercial value.

The two types of industrial site regeneration are industrial site ontology regeneration and space commercial regeneration. Historical culture and regional environment are critical factors for the regeneration of industrial sites (Doratli, Hoskara, & Fasli, 2004). At the same time, commercial space regeneration is another form of business rebuilt after the decline of the former commercial group (Ngidi, 2018), which explicitly includes the critical factors of commercial organizations and public evaluation. Researchers try to balance these two types of regeneration. Under the condition of generating economic value from commercial exploitation, to ensure the historical and cultural perfection of industrial sites, researchers try to evaluate the value of regeneration of industrial sites. In the industrial heritage creative Park, commercial value is a vital assessment layer, which can help the creative Park provide data conducive to the transformation. However, many industrial sites in

China need more evaluation of historical, cultural, and commercial value simultaneously. As a result, the industrial site creative park has no permanence. Suppose the value assessment can provide the double assessment data of historical culture and commercial groups to reconstruct industrial sites. In that case, it will become the basis for the regeneration of industrial sites.

This study attempts to use quantitative AHP (Analytic Hierarchy Process) and other mathematical methods for analysis (Al-Hagla, 2010). Li et al. (2008) conducted a study using AHP; the results show that evaluation content has a clear structure and hierarchy, creating a decision-making model for the culture of old industrial buildings and historic districts; it provides a decision-making basis for the regeneration of old industrial buildings and historic districts. AHP is feasible for old industrial buildings and historic districts, and can also be applied to researchers' researchers. Therefore, this study examines decisions made to renovate industrial sites and historic districts. However, this research focuses only on the assessment and decision-making of environmental areas and artistic value, without specific weight for industrial sites' historical and cultural value and commercial value. This study mainly focuses on the influence of the people on the historical and cultural value and commercial value, which is helpful to the balanced development of the decision-making on the historical and cultural value and commercial value of industrial sites.

This study provides a practical assessment of the regeneration of industrial sites, which preserves historical culture and infuses modern commercial institutions. It is assumed that commercial groups are an actual weight of industrial site regeneration, and injecting commercial groups can maximize the economic benefits of industrial sites, which will contribute to the regeneration of other industrial sites, thus bringing opportunities for the regional economy and public employment.

Research Objective

This study explores the influence of historical and cultural value and commercial value on the regeneration of industrial sites. It shows that commercial value is an actual weight for the regeneration of industrial sites through the value evaluation system.

Research hypothesis and AHP evaluation model framework

In order to verify the hypothesis that the ontological value of industrial heritage regeneration affects the commercial value, through the researchers, project managers, and project users involved in the industrial heritage regeneration project, The researchers evaluated the recycling value of industrial wastes and abandoned industrial buildings in 699 Cultural and Creative Park in Nanchang City, Jiangxi Province. The AHP evaluation model is as follows (Figure 1).

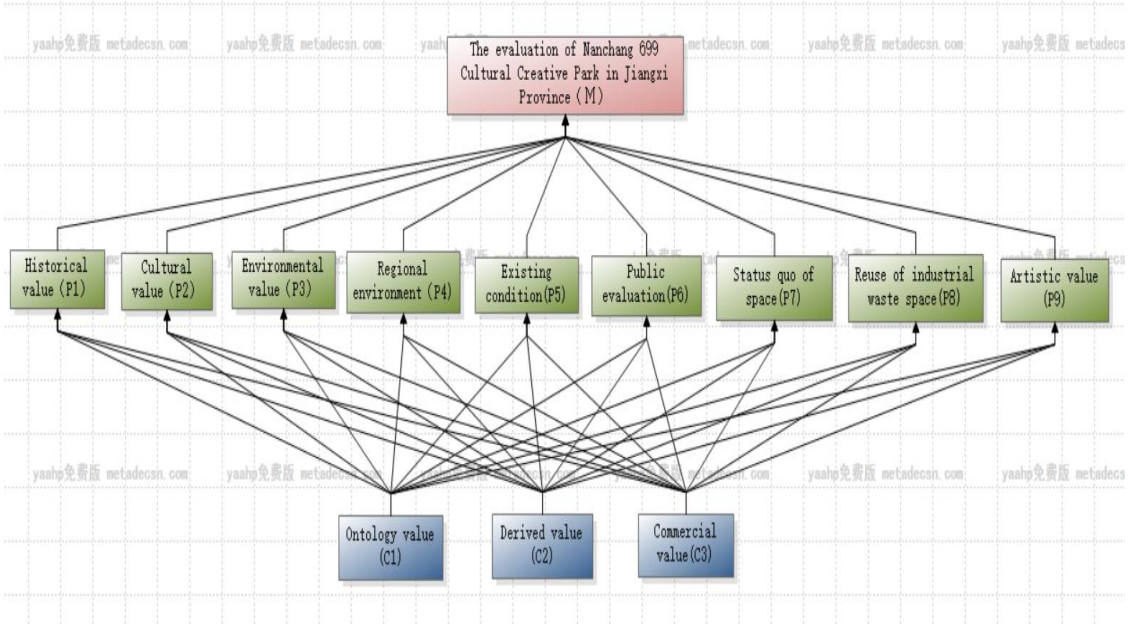

Figure 1 The AHP evaluation model

Literature Review

1. Historical development of industrial sites in China

In China, in order to revitalize the cultural industry, cultural and creative parks have been established by utilizing abandoned industrial sites in many places. For example, 798 Cultural and Creative Park in Beijing, the capital of China; "123" Cultural and Creative Park in Shenyang; "1865" Cultural and Creative Park in Nanjing; "F518" Cultural and Creative Park in Shenzhen; Nanchang "699" Cultural. These cultural and creative parks are based on the historical and cultural background of the concentrated factory area of China's textile industry (Cao, 2011). In the early days of the founding of New China, China became a textile power. After more than 60 years, textile groups no longer exist. However, the products that created value in the early days of Chinese industry still exist, and

the above products have been used again in modern times, playing the historical and cultural value (Daher, 2005).

2. Historical and cultural value of industrial sites in Nanchang, Jiangxi

Textile Factory has witnessed the course of industrial modernization development in Nanchang. First, the Jiangxi textile industry occupies an important position and establishes a complete research system of Jiangxi's industrial heritage. Doratli et al. (2004) published defining the research field of industrial culture, and experts have affirmed the cultural value of industrial sites. Under the promotion of the cultural industry revitalization policy, abandoned industrial sites have been transformed in Nanchang, Jiangxi Province, retaining the former industrial architecture style and industrial equipment, and on this basis, recreating the cultural and creative industry gathering area and presenting it in a new artistic way (Cheng & Hu, 2010). Therefore, the study also measures the influence of historical and cultural values.

3. Commercial value of industrial sites

Mesik (2007) took the three-old reconstruction project on the north bank of the Desheng River as the research object, evaluated the implementation of the reconstruction project, evaluated the technical indicators and social and economic benefits of the project, and determined the financial evaluation indicators of the project after the reconstruction. Liuzza (2008) used the theory of value engineering to evaluate and study the technical economy of the reconstruction of industrial buildings. They reflected the purpose of the comprehensive benefits of the reconstruction project by establishing the optimal value engineering model. Mazzanti (2013) analyzed the evaluation methods of Chongqing's industrial heritage by combining qualitative and quantitative evaluation methods, divided them into four protection levels, and worked out diversified protection and utilization modes to provide a reference for the protection and utilization of Chongqing's industrial heritage. Therefore, each business value evaluation will impact economic benefits differently.

From the above demonstration that the historical and cultural value of industrial sites affects the commercial value, the commercial value promotes historical and cultural development, and at the same time affects the economic interests, we can put forward the hypothesis that the commercial value is a significant weight to verify the existence value of industrial heritage.

Method

In order to verify the hypothesis that the ontological value of industrial heritage regeneration affects the commercial value, through the researchers, project managers, and project users involved in the industrial heritage regeneration project, The researchers evaluated the recycling value of industrial wastes and abandoned industrial buildings in 699 Cultural and Creative Park in Nanchang City, Jiangxi Province. This study uses a combination of qualitative and quantitative research methods, uses mathematical analysis methods to understand that the regeneration of industrial heritage is also the regeneration of the economic market, forms the framework of the value evaluation system of Nanchang 699 Cultural and Creative Park in Jiangxi Province, and uses Delphi analysis method, analytic hierarchy process and other mathematical methods for quantitative analysis.

1.Procedure

Through field research on Nanchang 699 Cultural and Creative Park, the researchers analyzed three value evaluation layers (C), nine-factor evaluation layers (P), and 28 sub-factor evaluation layers (D), which formed the value evaluation system (M) of Nanchang 699 Cultural and Creative Park (Table 1). The advantage of this research method is that the sample size is small, the researchers interact directly with the participants and, get detailed answers, then conduct content analysis.

Table 1 Value evaluation system of Nanchang 699 cultural and creative park

Value evaluation layer(C)	Factor evaluation layer(P)		Sub factor evaluation layer(D)
Ontology Value(C1)	Historical Value(P1)	1	Historical Origin(D1)
		2	Industrial Heritage Development(D2)
	Culture Value(P2)	3	Textile Mill Culture(D3)
		4	Concentrated Factory Culture(D4)
		5	Industrial Culture Inheritance(D5)

Table 1 Value evaluation system of Nanchang 699 cultural and creative park

Value evaluation layer(C)	Factor evaluation layer(P)		Sub factor evaluation layer(D)
Internal and External Conditions(C2)	Environmental Value(P3)	6	Ecological Environment Status(D6)
		7	Industrial Old Buildings(D7)
		8	Industrial Waste Materials(D8)
	Regional Environment(P4)	9	Traffic Convenience(D9)
		10	Resident Density(D10)
	Existing Conditions(P5)	11	Density of Business District(D11)
		12	Entertainment Venue(D12)
	Public Evaluation(P6)	13	Satisfaction(D13)
		14	Recognition(D14)
Commercial Value(C3)	Space Status(P7)	15	Factory Building Integrity(D15)
		16	Current Status of Factory Planning(D16)
	Heritage Renovation Value(P9)	17	Restaurant(D17)
		18	Cafe(D18)
		19	Bar(D19)
		20	Star Hotel(D20)
		21	Training Institution(D21)
		22	Art Studio(D22)
		23	Photography Studio(D23)
		24	Photography(D24)
	Artistic Value(P10)	25	Decorative Value Of Industrial Waste Materials(D25)
		26	Landscape Planning Layout(D26)
		27	Creation of Industrial Style(D27)
		28	Aesthetic Value(D28)

Ten people were selected as research and interview subjects in this assessment. include:(1) 6 participants: professors and postgraduate students from the Department of Architecture, Department of Art and Design of Nanchang University (Researchers and research participants in industrial sites); (2) 2 participants: supervisor and staff of Nanchang 699 Cultural and Creative Park in Jiangxi (Manager of industrial site regeneration); (3) 2 participants: residents around the Park (Users of industrial site regeneration). These research objects are all experts and participants who have studied relevant content, relevant project managers, and project users. Taking them as interview objects, we can see the value of industrial site regeneration from three different perspectives.

In the first stage of the study, the evaluation index was constructed according to the descriptors of 12 factors in the value evaluation layer (C) and factor evaluation layer (P) (Table 1), namely, the pair-to-pair comparison scale of evaluation indicators (Table 2). Ten interviewees were selected to mark the importance of comparison factors on the pair-to-pair comparison scale (1-5 points represented the gradual increase of the importance of the former item compared with the latter. 1/5-1 means that the last item is progressively less critical than the previous one, where 1 means equally essential).

Table 2 Pairwise comparison scale

	1/5	1/4	1/3	1/2	1	2	3	4	5	
Ontology Value(C1)										Internal and External Conditions(C2)
Ontology Value(C1)										Commercial Value(C3)
Internal and External Conditions(C2)										Commercial Value(C3)
Historical Value(P1)										Culture Value(P2)

Table 2 Pairwise comparison scale

	1/5	1/4	1/3	1/2	1	2	3	4	5	
Historical Value(P1)										Environmental Value(P3)
Culture Value(P2)										Environmental Value(P3)
Regional Environment(P4)										Existing Conditions(P5)
Regional Environment(P4)										People's Evaluation(P6)
Existing Conditions(P5)										People's Evaluation(P6)
Space Status(P7)										Heritage Renovation Value(P8)
Space Status(P7)										Artistic Value(P9)
Heritage Renovation Value(P8)										Artistic Value(P9)

In the second stage of the study, after establishing the framework of the value evaluation system (Table 1), the analytic hierarchy process (AHP) software is introduced to make a judgment matrix for each layer. The researchers used the pairwise comparison method proposed by Saaty and scale values 1-9 for quantitative analysis of the judgment matrix (Table 3). The researcher constructs a pair comparison matrix between each factor of each layer and each factor of the upper layer and selects the optimal result through the paired comparison of each factor. When CR < 0. 1, the consistency of the judgment matrix is acceptable. Secondly, The matrix value of the judgment matrix computes the standardized feature vector of the factor evaluation layer. When the calculation method and process of the standardized feature vector are the same, Researchers need to obtain 9

standardized eigenvectors of the judgment matrix. Finally, The results are sorted and selected to determine the optimal value evaluation weight. The weight value of each layer in the industrial heritage is the direct verification of the regeneration value of the industrial heritage. The weight value is applied to analyze the influencing factors of the advantages of each layer.

2.Research tools

The research applies interview questionnaires as the research tool, which is divided into key questionnaires and ordinary questionnaires. The key questionnaires are mainly for experts, and the ordinary questionnaires are mainly mainly for customers. The Factor Layer is divided into 9 factors, and the Sub-Factor Layer is divided into 28 sub-factors (Table 1). Each factor layer is weighted and scored. Participants conduct a detailed analysis of each factor, and apply the scale of the judgment matrix to score (Table2-3). The scale is based on the factor evaluation layer to compare factors pair by pair. Finally, the final weight of the factor evaluation layer is obtained through the AHP software (Table 4-6). These weight values can be applied for researcher to evaluate the relevant value in the industrial heritage.

Table 3 Scale of AHP (Analytic Hierarchy Process) judgment matrix

Scale	Indication
1	Indicates that when comparing two factors, two factors are equally important
3	Indicates that when comparing two factors, one factor is slightly more important than the other
5	Indicates that when comparing two factors, one factor is obviously more important than the other
7	Indicates that when comparing two factors, one factor is strongly more important than the other
9	Indicates that when comparing two factors, one factor is extremely more important than the other

Table 3 Scale of AHP (Analytic Hierarchy Process) judgment matrix

Scale	Indication
2, 4, 6, 8	The median value of the above two adjacent judgments
Reciprocal	If factor i is compared with j to judge aij, then factor j is compared with i to judge aij=1/aij

Research Results

With the utilization of factor analysis methods, the data will be applied to explain the evaluation of the reuse value of industrial heritage of Nanchang 699 Cultural and Creative Park in Jiangxi. The research describes the value of the 9 factors, analyzes the sub- factors' weight value of the evaluation layer in detail, and accurately describes the regeneration value of industrial heritage with data, which has reference value and feasibility for the utilization and development of industrial heritage. Based on the research on the evaluation weights of the value evaluation of Nanchang 699 Cultural and Creative Park in Jiangxi, the thesis discusses the value evaluation of each factor, and the quantitative results of the evaluation of the status of Industrial heritage are as follows:

In the process of value valuation of 699 Cultural and Creative Park, the ultimate goal of calculation is to quantify the industrial heritage, reflect the influence of historical value on the current development of commercial value, find the advantages and disadvantages of the development of industrial heritage, and provide precise goals and positioning for the future planning and development of industrial heritage. Therefore, the research not only gains the overall score of the industrial heritage value of the Cultural and Creative Park, but also obtains the special score of the industrial heritage value, and made specific analysis according to the weight value and score value in the calculation and statistics of the weight value of the value evaluation of 699 Cultural and Creative Park. Calculated by AHP software, as shown in Table 4, according to the value weight of C- layer of 6 99 Cultural and Creative Park, the Ontology Value is 0.4505, the Internal and External Conditions value is 0.0906, and the Commercial Value is 0.4589. The overall calculation result of 699 Cultural and Creative Park is shown in Table 4.

As shown, the research obtains the value evaluation statistics of the P-layer of 699 Cultural and Creative Park

Table 4 The weight results of Value Evaluation Layer (C)

Value Evaluation Layer C	**Weight**
Commercial Value C 3	0.46
Ontology Value C 1	0.45
Internal and External Conditions C 2	0.09

1. Analysis of the evaluation results of industrial heritage regeneration value

1.1 Analysis of the Ontology Value of Nanchang 699 Cultural and Creative Park in Jiangxi

Data show that, in the evaluation of ontology value, the weight value of environmental Value is lower than the other two factors, and the weight value of industrial waste is the lowest, which affects the weight value of environmental Value (Table 5).

(1) The Historical Value, as shown in Table 6, the Historical Origin in the sub-factors has a higher weight. The predecessor of 699 Cultural and Creative Park was Jiangxi Hua'an Knitting Mill. Founded in 1957, the Mill has a history of nearly 60 years, which has witnessed the industrial development process of Jiangxi Province from the "First Five-Year Plan" to the present. The factory building has a long history, and the overall layout of the building is complete and practical with high historical Value.

(2) The Cultural Value, as shown in Table 6, the sub-factors include Textile Culture, Concentrated Factory Culture, and Industrial Cultural Inheritance. Among them, Textile Culture has the highest weight value. As the material carrier of culture, industrial heritage and architectural heritage have a particular impact on the development of current cultural patterns. For example, the Soviet-style buildings inside the textile factory symbolize the cultural pattern of that era. The textile factory has become a landmark building in Nanchang City. The integration of industrial historical buildings and landscape reflects the glory and inheritance of the culture of the concentrated factory area.

(3) The Environmental Value, as shown in Table 6, the Ecological Environment in the sub-factors has the highest weight value. The outstanding contribution of environmental Value is based on the Historical Value and Cultural Value of the heritage.

In the Ontological Value of Nanchang 699 Cultural and Creative Park in Jiangxi, the material form of Cultural Value reflects the importance of Historical Value, and the industrial architecture and landscape in Cultural Value promote the industrial regeneration value of the industrial ecological environment. Environmental Value lays the foundation for the regeneration of industrial heritage and provides good external conditions for the development of Commercial Value.

1.2 Results analysis of the internal and external conditions of Nanchang 699 Cultural and Creative Park in Jiangxi

As shown in Table 4, in the overall value evaluation of industrial heritage, the score of influence of internal and external conditions is the lowest, which is 0.0906, indicating the lowest influence of internal and external conditions. As shown in Table 5, the ranking of the scores of the three indicators in evaluating internal and external conditions, from most to least, is people's evaluation, regional environment, and existing conditions. Regarding the regional environment, the convenience of transportation around the factory could be more satisfactory, which is not conducive to business development. Also, before any development, resident density played a minor role. As shown in Table 5, People's evaluation takes the most significant proportion in evaluating internal and external conditions. The high degree of public recognition indicates that the commercialization of industrial heritage can be developed long term, and the commercial value of industrial heritage can be created.

1.3 Analysis of commercial value results of Nanchang 699 Cultural and Creative Park in Jiangxi

As can be seen from the analysis of Table 4, the value of heritage renovation occupies the most significant proportion of the commercial value, indicating that the prominence of commercial value makes the renovation meaningful.

The principle of industrial heritage regeneration is to preserve the original historical style, spatial layout, and industrial style. In Table 5, the weight value of the integrity of the factory building is the highest among the spatial state factors, indicating that the integrity of the factory building provides good internal and external conditions for the transformation of industrial heritage. Table 6 shows that businesses settled after the factory transformation include restaurants, cafes, bars, star

hotels, training institutions, art studios, and photography studios. As shown in Table 6, the artistic aesthetic value with a high weight attracts many photography lovers, followed by bars, restaurants, and training institutions with a high weight. The settlement of different kinds of merchants has changed the depression of 699 Cultural and Creative Park, increased the economic income of 699 Cultural and Creative Park, and directly promoted the realization of commercial value in the commercial process (Figure 2).

Picture 1	Picture 2	Picture 3	Picture 4
			
Picture 5	Picture 6	Picture 7	Picture 8
			

Figure 2 Building appearance

Source: Author

2. Summary of the assessment results of industrial heritage regeneration value

The analysis of the weight value of the value evaluation of the Nanchang 699 Cultural and Creative Park in Jiangxi shows that the same layer indicators reflect different weight values. In general, the discussion of all data under this evaluation system are of certain significance, and it is feasible and applicable for the protection and utilization of industrial heritage.

Based on the investigation and analysis of the current situation of 699 Cultural and Creative Park, the thesis mainly discusses the factors, construction process and evaluation results of the

value evaluation system of 699 cultural and creative park. The focus is on the factors to be considered, the construction process and the evaluation results of the value evaluation system of 699 Cultural and Creative Park. The Ontological Value, Internal and External Conditions and Commercial Value of 699 Cultural and Creative Park are the three major indicators of the industrial heritage value evaluation system. After the previous analysis of the status of industrial heritage, many evaluation factors and sub-factors that affect the three indicators are extracted and constructed the 699 Cultural and Creative Park value evaluation system. What's more, the researcher obtains the weight of the value evaluation system of 699 Cultural and Creative Park through Delphi analysis and AHP (Analytic Hierarchy Process) analysis, analyzes the importance of the regeneration value of industrial heritage to promote business and economic development, and provides a certain data reference for other similar regional transformation and policy formulation through the comparison of the weight value and the analysis of the results.

Table 5 The weight results of Factor Evaluation Layer Value (P)

Factor Evaluation Layer Value P	**Weight**
Historical Value P 1	0.33
Cultural Value P 2	0.21
Heritage Renovation Value P 8	0. 12
Space Status p 7	0.09
Artistic Value P 9	0.08
Public Evaluation P 6	0.07
Environmental Value P 3	0.07
Regional Environment P 4	0.02
Existing Conditions P 5	0.02

Table 6 The weight results of the sub factor evaluation layer (D)

Sub factor evaluation layer(D)	Weight
Historical Origin(D1)	0.15
Industrial Heritage Development(D2)	0.17
Textile Mill Culture(D3)	0.13
Concentrated Factory Culture(D4)	0.11
Industrial Culture Inheritance(D5)	0.16
Ecological Environment Status(D6)	0.11
Industrial Old Buildings(D7)	0.03
Industrial Waste Materials(D8)	0.04
Traffic Convenience(D9)	0.09
Resident Density(D10)	0.18
Density of Business District(D11)	0.12
Entertainment Venue(D12)	0.12
Satisfaction(D13)	0.12
Recognition(D14)	0.28
Factory Building Integrity(D15)	0.19
Current Status of Factory Planning(D16)	0.09
Restaurant(D17)	0.11
Cafe(D18)	0.10
Bar(D19)	0.28
Star Hotel(D20)	0.09
Training Institution(D21)	0.14
Art Studio(D22)	0.10

Table 6 The weight results of the sub factor evaluation layer (D)

Sub factor evaluation layer(D)	Weight
Photography Studio(D23)	0.09
Photography(D24)	0.12
Decorative Value Of Industrial Waste Materials(D25)	0.15
Landscape Planning Layout(D26)	0.12
Creation of Industrial Style(D27)	0.15
Aesthetic Value(D28)	0.13

Discussion

The development history and change of industrial heritage have influenced the historical factors of industrial heritage so that the industrial heritage has protection value. The textile factory culture of Nanchang 699 and the remains of the collective factory have laid the cultural milepost of Nanchang 699 cultural and creative Park, highlighting its cultural value factors. The ecological environment, old industrial buildings, and industrial wastes belong to the environmental value factors, but the environmental value has little impact on the ontology value of industrial heritage. Therefore, the historical and cultural value factors have a more significant impact on the ontology value. Among the internal and external factors, public evaluation has the most significant influence on commercial value. Architectural factors and spatial layout factors affect the spatial form. Many merchants settle in and make full use of the original architectural space. The industrial style belongs to one of the design styles with artistic value, so artistic value factors significantly influence commercial value factors.

The historical and cultural value of industrial heritage belongs to the noumenon value, which will affect the commercial value of industrial heritage. By adding cultural elements, the original commercial space can gain more cultural significance and further enhance its commercial value. The preservation and restoration of these sites is not only important for cultural and historical reasons, but can also add value to the local regional economy. By strengthening the cultural elements of these sites, they can be more attractive to tourists and businesses, and attract more visitors interested in the history and culture of the region, thereby boosting economic growth in the region.

Commercial value factors drive regional economic development, so that abandoned industrial heritage in another form of commercial revival. By harnessing the commercial potential of abandoned industrial sites, they can benefit the revitalization of local economies. The process can create jobs, attract investment and boost the region's overall growth. Therefore, the noumenon value of industrial heritage is an important factor affecting commercial value.

Industrial heritage has been redeveloped and utilized to realize commercial value in another form. Most of the old industrial heritage in Nanchang, Jiangxi Province, is located in the old city, facing the problem of economic decline and lack of vitality. To transform the old factory into an industrial-style landscape environment and form a characteristic business circle, the regeneration of industrial heritage usually requires many human resources, such as architects, designers, construction workers, and security guards. According to statistics, industrial heritage regeneration projects can create about 15 jobs per 1,000 square meters on average. Industrial heritage regeneration can improve the urban environment and quality, improve the quality of life of residents and the attractiveness of the city, become a fashionable cultural and artistic district, attracting a large number of artists, creative enterprises, and young people to live and work.

Conclusion

This study aims to evaluate the regeneration value of 699 Cultural and Creative Park industrial heritage sites in Nanchang, Jiangxi, using the factor analysis method to provide an empirical perspective for the reuse of heritage. Core issues are analyzed from a tripartite perspective through business value, ontological value, and internal and external conditions. The study found vital insights, one of the key findings being the dominance of business value and ontology value in the overall evaluation, suggesting that intrinsic and economic factors strongly influence reuse value. In addition, public recognition of internal and external conditions has also become a significant contributor, which implies the importance of community involvement and acceptance of the reuse of industrial heritage. The findings reinforce a multi-dimensional approach to industrial heritage assessment, highlighting the need to balance economic viability with historical, cultural, and environmental factors. However, the study also has limitations, such as its inherent reliance on the particularity of Nanchang 699 Cultural and Creative Park, which may affect its promotion in other contexts. Future research should explore the transferability of these findings to other industrial heritage sites nationally and internationally. In addition, it would be helpful to study the long-term

impact of these regeneration projects on local communities, thereby deepening our understanding of the socio-cultural implications of the reuse of industrial heritage.

References

Al-Hagla, K. S. *(2010). Sustainable urban development in historical areas using the tourist trail approach: A case study of the Cultural Heritage and Urban Development (CHUD) project in Saida, Lebanon. Cities, 27*(4), 234–248. https://doi.org/10.1016/j.cities.2010.02.001

Cao, C. M. (2011). *The analysis of Guangxi's cultural and creative industries development*. In *2011 IEEE 18th International Conference on Industrial Engineering and Engineering Management (pp.2110-2113)*. Changchun, China: IEEE.

Carvalho, C. S., Forester, B. R., Mitre, S. K., Alves, R., Imperatriz-Fonseca, V. L, Ramos, S. J., Resende-Moreira, L. C, Siqueira, J. O., Trevelin, L. C., Caldeira, C. F., Gastauer, M., & Jaffé, R. (2021). *Combining genotype, phenotype, and environmental data to delineate site-adjusted provenance strategies for ecological restoration*. *Molecular Ecology Resources, 21*(1), 44–58. https://doi.org/10.1111/1755-0998.13191

Chemat, F., Rombaut, N., Meullemiestre, A., Turk, M., Perino, S., Fabiano-Tixier, A.-S., & Abert-Vian, M. (2017). *Review of green food processing techniques. Preservation, transformation, and extraction*. *Innovative Food Science & Emerging Technologies, 41,* 357–377. https://doi.org/10.1016/j.ifset.2017.04.016

Cheng, H., & Hu, Y. (2010). Planning for sustainability in China's urban development: Status and challenges for Dongtan eco-city project. *Journal of Environmental Monitoring, 12*(1), 119–126. https://doi.org/10.1039/B911473D

Daher, R. (2005). *Urban regeneration/heritage tourism endeavours: the case of Salt, Jordan 'Local actors, International donors, and the state'*. *International Journal of Heritage Studies, 11*(4), 289–308.

Doratli, N., Hoskara, S., & Fasli, M. (2004). An analytical methodology for revitalization strategies in historic urban quarters: a case study of the Walled City of Nicosia, North Cyprus. *Cities, 21*(4), 329–348.

Freeman, R. (2001). Single-peaked versus diversified capitalism: The relation between economic institutions and outcomes. Income J. Drèze (Ed), *Advances in Macroeconomic Theory* (pp. 139–170). UK: Palgrave Macmillan.

Li, M., Wu, B., & Cai, L. (2008). *Tourism development of world heritage sites in China: A geographic perspective*. *Tourism Management, 29*(2), 308–319. https://doi.org/10.1016/j.tourman.2007.03.013

Liuzza, C. (2008). The ICOMOS ENAME carter for the interpretation and presentation of cultural heritage sites: The initiative, its development and its future applications. Retrieved May 1, 2023, from http://www.vziliao.com/Entrance/Open/1469c1d7-5c4e-4b28-a72f-15ddc89d835a

Mazzanti, M. (2013). *Valuing cultural heritage in a multi-attribute framework microeconomics perspectives and policy implications*. *Journal of Behavioral and Experimental Economics*, *32*(5), 549–569.

Mesik, J. (2007). Community foundations: A tool for preservation of cultural heritage in social development notes. *Social Development Notes Community Driven, 108*, 1-4.

Ngidi, L. (2018). *Assessing the inclusiveness of urban regeneration projects: the case study of point waterfront development precinct, Durban* (Masters' Thesis, University of KwaZulu-Natal).

Osman, K. A., & Farahat, B. I. (2018). *The conservation of the waterfront of Saida: A model for tourism and culture-led revitalization in valuable areas. HBRC Journal, 14*(3), 321–333. https://doi.org/10.1016/j.hbrcj.2017.02.003