

Study on the Value Evaluation and Protection of Tangshan Industrial Heritage

——Take Huaxin Textile Factory in Tangshan as an Example

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Abstract

Industrial heritage can carry the historical information of the level of industrial technology development in an era, display the historical appearance of a city and even a country's industrial culture, and present the historical traces of social and economic development in a specific period. As the cradle of modern industry, Tangshan's industrial culture has become an important carrier of urban life from the establishment of Kaiping Mining Bureau to the construction of Tangxun railway, from the completion of Qixin cement to the manufacture of Longhao locomotive, recording the evolution of Chinese history and the hard development of industry since modern times. However, with the rapid development of urbanization, Tangshan is faced with industrial restructuring and upgrading. How to promote industrial transformation and upgrading, "high-quality" development, preserve industrial heritage and tap its value of the times has become an urgent task. It has become an important issue to find the best protection and reuse mode to retain Industrial heritage through an objective and comprehensive evaluation of the value of industrial heritage. The author takes Huaxin Textile Factory of Tangshan as an example.

Keywords

urban context, industrial heritage, Tangshan Huaxin Textile Factory.

1. Introduction

Industrial heritage refers to the industrial cultural heritage that records the rise and fall of industrial development and carries the historical information and the characteristics of the times. It is the spiritual core of a city's survival and development. To abandon it will undoubtedly cut off the connection between the historical accumulation of the city and the social reality, cut off the blood line of the city's cultural heritage and the development of the times, cut off the generations of economic development and the optimization and adjustment of the industrial structure Relationship. This paper establishes a comprehensive evaluation system based on value cognition, analyzes the value composition of industrial heritage in Tangshan, and divides the value of industrial heritage into five aspects: historical culture, social economy, science and technology, environmental art and urban memory. This paper discusses the evaluation system of the industrial heritage value combining qualitative and quantitative analysis with the analytic hierarchy process, and evaluates the industrial heritage value of Huaxin Textile Factory in Tangshan. On this basis, it formulates the corresponding protection planning strategy, combines the strict planning control management, selects the appropriate protection and utilization measures, and finally achieves the proper protection and rational utilization of the industrial heritage.

2. Recognition of Industrial Heritage Value in Tangshan

2.1. Overview of Industrial Heritage in Tangshan

Tangshan is one of the birthplaces of modern industry, which originated from the Westernization Movement. In 1878, the founding of Kaiping Mining Bureau opened the first glorious page of modern industry in Tangshan. Then, Tangshan was born the first steam locomotive repair factory in China, tangxu railway repair factory (locomotive factory). In 1889, tangtingshu founded Tangshan fine cotton soil factory (Qixin cement factory), which was in the Westernization Movement In China, Tangshan has built a number of modern enterprises such as coal mines, transportation and cement. In 1919, Zhou Xuexi founded TangChang (the predecessor of Tangshan Huaxin Textile Factory), the third factory of Huaxin Textile Company, in Tangshan. So far, the modern industrial system of Tangshan has initially formed, thus opening a new chapter of Tangshan industry. More than 100 years of development has accumulated a large number of industrial heritages in Tangshan. In 2018, Kailuan coal mine, Qixin cement plant, tangxu railway repair plant, railway site, magnetic plant and Luanhe iron bridge were selected into the first batch of China's industrial heritage protection list. It can be seen that Tangshan's industrial heritage resources are rich, categories are complete, geographical distribution is centralized and combination is orderly. These advantages provide convenient conditions for the development and promotion of industrial heritage protection and reuse.

2.2. Industrial Heritage Value Evaluation of Tangshan

2.2.1. Construction of Value Evaluation System

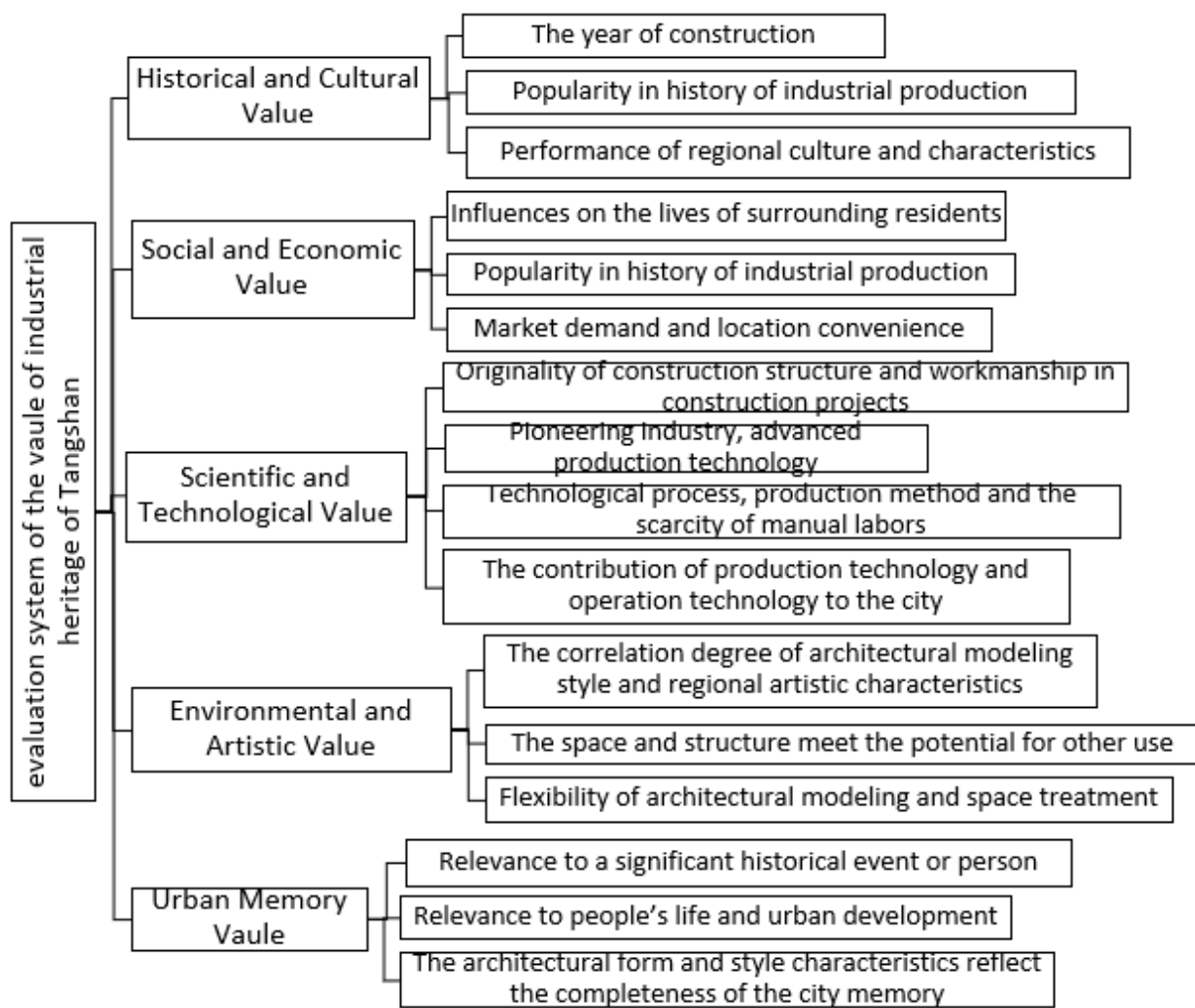
2.2.2. Composition of Evaluation Factors

Based on the evaluation system of relevant literature and the classification, investigation and evaluation of tourism resources (GB / t18972-2003), and based on the cognition of the four aspects of industrial heritage in Tangshan City, this paper initially constructs the evaluation index system and then consults with experts, modifies and improves it, and finally forms the evaluation index system of industrial heritage value. As shown in Figure 3, the industrial heritage value evaluation system of Tangshan city is divided into two levels: the first level is the first level indicator evaluation level, including five aspects of historical and cultural value, social and economic value, scientific and technological value, artistic environment value and urban memory; the second level is the second level indicator value factor evaluation level, with 18 value factors selected under the previous level indicators.

Table 1. Tangshan's major modern industrial heritage

Number	Name	Time	Address	Value
1	Kailuan Coal Mine	1878	54, Xinhua East Road	China's earliest modern large-scale mechanized coal mining
2	Tangxu Railway	1881	East Side of No. 1 well, Kailuan Tangshan Mine	China's first railway with standardized gauge, first steam locomotive, China's first self-established railway company, the earliest railway station-Xugezhuang Station
3	Qixin Cement Factory	1889	15, Xinhua East Road	China's first cement plant, the birthplace of China's cement industry, the cradle of China's cement machinery manufacturing
4	Luanhe Railway Bridge	1892	Intersection between Changli and Luan County	The first large railway bridge in modern China , the first railway bridge built by the Chinese themselves, Zhan tianyou first adopted the pressure caisson method to solve the engineering problems
5	Tangxu Railway Repair Shop	1881	No.19, North Side of Yuegezhuang Road	China's first railway factory, some of the workshop sites are listed as permanently preserved earthquake relics.
6	Tangshan Ceramics Factory	1909	No.31, South Longze Road, Tangshan City	China's first manufacturer of architectural ceramics, the office building is a provincial cultural relic protection unit.
7	Hans Villa	1914	No.31, South Longze Road, Tangshan City	The main residence of Hans kunder, the chief technician of qishin yangash co., LTD., when he worked in Tangshan, It is listed as a cultural relic protection unit in Tangshan.
8	Room 9/10, Zhaogezhuang Mine, Kailuan	In the early 20th century	West Side of Zhaogezhuang Residential Area, Tangshan City	Residence areas for foreigners of Kaiping mining bureau
9	Kailuan Coal Mine (Subsidence Area)	1996	Nanhu Park,Tangshan	Subsidence area of coal mining, later transformed into urban open space
10	Tangshan Flour Factory	1930	Northeast Side of the Intersection between North New East Road and South Longze Road	A Japanese - puppet - era ammunition depot, later expanded into a grain depot in the 1980s
11	Huaxin Textile Factory	1919	Intersection between Xinhua East Road and Binhe Road, Lunan District	The first textile dyeing joint enterprise of a certain scale in hebei province. The original site has been allocated, waiting for development and construction of real estate.
12	Coal River	1881	Xugezhuang, Fengnan District	It was specially dug for transporting coal from kailuan coal mine, which contributed to the early development of kaiping mining bureau and the prosperity of industry and commerce along the coast.
13	Workshop of Brick Factory of Kailuan Mining Bureau	1920	38, Kuangxi Road, Majiagou Town, Kaiping District, Tangshan City	China's first refractory enterprise who adopted inverted flame kiln firing technology. This workshop is a construction brick workshop built in 1920, which occupies an important position in the development of China's refractory materials.
14	West Bridge and East Bridge of Double Bridge	1899	Lunan District	It is the earliest railway, highway and pedestrian three-dimensional transport bridge in China, and has symbolic significance to the history of bridge construction in China.

(Source: self-painting)



(Source : self-painting)

Figure 1. Evaluation system of industrial heritage of Tangshan

2.2.3. Composition of Evaluation System

The author chooses further value factors according to different aspects of value, and finally combines the characteristics and current situation of industrial heritage in Tangshan city to build an evaluation system of industrial heritage value belonging to Tangshan city. Among them, the value factors play an important role in the evaluation system. The author uses AHP to calculate the weight of each factor, and combines the questionnaire for experts and the consistency test for the results of the questionnaire to form the index weight based on the average value of the judgment matrix of the questionnaire (Table 2).

Table 2. Comprehensive evaluation table of industrial heritage of Tangshan

Primary Indicator	Weight	Secondary Indicator	Index Classification				
			I	II	III	IV	V
			9~10	7~8	5~6	3~4	0~2
Historical and Cultural Value	0.1197	①The year of construction	Before 1911	1911~1948	1949~1965	1966~1976	After 1976
	0.0803	②Popularity in history of industrial production	Prominent	higher	Average	Weak	None
	0.0573	③Performance of regional culture and characteristics	Prominent	higher	Average	Weak	None
Social and Economic Value	0.0565	①Influences on the lives of surrounding residents	Prominent	good	Average	Bad	Very bad
	0.0547	② Popularity in history of industrial production	Prominent	Easy	Average	Difficult	Very difficult
	0.0724	③ Market demand and location convenience	Prominent	Convenient	Average	Bad	Very bad
Scientific and Technological Value	0.0672	① Originality of construction structure and workmanship in construction projects	Prominent	good	Average	Low	None
	0.0686	② Pioneering industry, advanced production technology	Prominent	good	Average	Low	None
	0.0393	③Technological process, production method and the scarcity of manual labors	Prominent	good	Average	Low	None
	0.0321	④ The contribution of production technology and operation technology to the city	Prominent	good	Average	Low	None
Environmental and Artistic Value	0.0573	① The correlation degree of architectural modeling style and regional	Prominent	higher	Average	Weak	None

		artistic characteristics					
	0.0391	② The space and structure meet the potential for other uses	Prominent	Easy	Average	Difficult	Very difficult
	0.0256	③ Flexibility of architectural modeling and space treatment	Prominent	Easy	Average	Difficult	Very difficult
Urban Memory Value	0.0984	① Relevance to a significant historical event or person	Prominent	higher	Average	Weak	None
	0.0672	② Relevance to people's life and urban development	Prominent	good	Average	Low	None
	0.0643	③ The architectural form and style characteristics reflect the completeness of the city memory	Prominent	higher	Average	Weak	None

(Source: self-painting)

The author uses AHP to calculate the weight of each value factor in the evaluation system. Combined with the questionnaire for relevant experts and the consistency test for the results of the questionnaire, the index weight based on the average value of the questionnaire judgment matrix is formed. From table 2, it can be seen that the weight proportion of historical and cultural value and urban memory value is the highest 0.2572 and 0.2299 respectively, indicating that as an industrial heritage, the historical development of Tangshan city is most closely linked, and the historical and cultural value and urban memory value are also the core factors for the future development of industrial heritage value in a region. The second is social economic value (0.1836) and scientific and technological value (0.2072). Most of the industrial historical remains of Tangshan City represent the most advanced level of science and technology at that time, which is also an important support for the industrial heritage value of Tangshan city. However, the weight of artistic environment value is the lowest, which is 0.1220, mainly because compared with other urban industrial heritage, the artistic value of industrial heritage in Tangshan is relatively low, and the importance of industrial heritage artistry is relatively low. Finally, each value factor is divided into fuzzy grades to form the industrial heritage value evaluation system of Tangshan. Finally, the professional researchers combine the evaluation grades and scores to make a score evaluation of the industrial heritage of Tangshan, forming a quantitative score evaluation for the industrial heritage of Tangshan.

2.2.4. Industrial Heritage Value Evaluation of Tangshan

According to the established industrial heritage value evaluation system, the existing 14 major industrial heritages in Tangshan are evaluated, and the comprehensive scores of various industrial heritages are obtained quantitatively, as shown in Table 3.

Table 3. Evaluation of industrial heritage value of Tangshan

Name	Historical and cultural value	Social and economic value	Scientific and technological value	Environmental and artistic value	Urban memory value	Total score	Grade
Kailuan Coal Mine	2.40	1.69	1.86	0.85	2.23	9.04	Cultural relics
Tangxu Railway Repair Shop	2.46	1.60	1.96	1.01	2.00	9.03	Cultural relics
Qixin Cement Factory	2.38	1.51	1.72	1.11	1.94	8.65	Protection
Luanhe Railway Bridge	2.12	1.10	1.47	0.93	1.70	7.33	Protection
Tangxu Railway	2.18	1.30	1.55	0.81	1.51	7.36	Protection
Tangshan Ceramics Factory	1.93	1.14	1.48	0.94	1.61	7.10	Protection
Hans Villa	1.61	1.03	1.03	0.99	1.60	6.26	Transformation
Room 9/10, Zhaogezhuang Mine, Kailuan	1.61	1.03	1.03	0.97	1.44	6.08	Transformation
Kailuan Coal Mine (Subsidence Area)	1.53	1.25	1.17	0.87	1.05	5.87	Transformation
Tangshan Flour Factory	1.55	0.86	1.07	0.93	1.55	5.96	Transformation
Huaxin Textile Factory	1.47	0.86	1.04	0.73	1.48	5.58	Transformation
Coal River	2.02	0.79	0.99	0.65	1.42	5.87	Transformation
Workshop of Brick Factory of Kailuan Mining Bureau	1.59	0.79	1.00	0.71	1.15	5.23	Transformation
West Bridge and East Bridge of Double Bridge	1.47	0.73	0.96	0.65	1.15	4.96	Average

(Source: self-painting)

2.2.5. Analysis of Evaluation Results

Finally, the industrial heritage of Tangshan city is divided into four levels according to the evaluation results. More than 9 of them are cultural relic industrial heritages, including the sites of Kailuan coal mine and tangxu railway repair factory; those between 7 and 9 are protective utilization industrial heritages, including Qixin cement factory, Luanhe iron bridge, tangxu railway and Tangshan Ceramics Factory; those between 5 and 7 are transformation utilization industrial heritages, including 7 sites such as Huaxin Textile Factory and Hans villa; Those with a score less than 5 are general industrial remains, and there is one existing Lixi bridge and one east bridge.

Based on the field visit and literature review of 14 industrial heritages in Tangshan City, the author finds that the protection status of industrial heritages in Tangshan is uneven, among which Kailuan coal mine, Qixin cement, tangxu railway, Luanhe iron bridge, tangxu railway repair factory and Tangshan Ceramics Factory have been selected into the first batch of China's industrial heritage protection list in 2018, and Tangshan City has begun to launch the six industrial heritages Certain protection and Transformation: the site of Tangshan Locomotive and rolling stock factory, combined with Tangshan earthquake site park, has become an important exhibition window of Tangshan earthquake site; combined with Kailuan coal mine site and the beginning of tangxu railway, it has been developed into Kailuan National Mine Park; at present, the site of Qixin cement factory has been transformed into Qixin 1889 cultural and creative park, integrating tourism, leisure and shopping Hans villa has been restored. However, the author is puzzled that Huaxin Textile Factory, Kailuan Mining Bureau, Qixin cement factory and locomotive and rolling stock factory were the four pillar enterprises of Tangshan in modern times. In terms of protective development, Huaxin Textile Factory was far behind the other three enterprises. Kailuan National Mining Park, Qixin 1889 cultural and Creative Industrial Park and the earthquake site park based on the former site of locomotive and rolling stock factory are Tangshan workers As one of the four leading industrial enterprises, Huaxin Textile Factory should have a place in Tangshan Industrial Museum, but unfortunately, there is not a word of her in the exhibition hall.

3. Industrial Heritage of Tangshan Huaxin Textile Factory

3.1. Overview of Tangshan Huaxin Textile Factory

Tangshan Huaxin Textile Factory is located in the southeast of Tangshan. It is adjacent to Jingfeng railway in the South and Douhe River in the West. If Douhe river is the vertical axis and Jingfeng railway is the horizontal axis, TangChang is located in the third quadrant. The former is TangChang of Huaxin Textile Co., Ltd., which is the fourth factory of Huaxin Textile Co., Ltd. (Tianjin factory, Qingdao factory, Tangshan factory and Weihui factory) founded by Zhou Xuexi, a famous industrialist First, Huaxin Textile Co., Ltd. was established during the first World War. Zhou Xuexi, then the finance minister of Beiyang government, together with Li Ximing, the general manager of Qixin gray company, Wang Xiaoting, the assistant manager, and so on, set up Huaxin Textile Co., Ltd. in Tianjin. The company was established in 1918, with Tianjin factory, Qingdao factory, Tangshan factory and Weihui factory. In 1923, all 24000 spindles of Tangshan Huaxin were put into production, becoming the first modern machine textile factory in Hebei Province. After the September 18th Incident in 1931, Japan occupied the northeast and began to destroy the national textile industry in China. In 1936, Tangshan Huaxin Textile Factory was seized by Japanese businessmen. After Japan's investment, Tangshan Huaxin Textile Co., Ltd. took back the right of operation and management, and its production and operation were maintained The current situation, in December 1948, Tangshan was liberated, Huaxin Textile Factory returned to the people's embrace, and the enterprise has since embarked on a broad road of development and growth. In 1979, Tangshan Municipal government decided to change Huaxin Textile Factory from one factory to two factories. Huaxin Textile Factory was relocated to Fengrun new area for reconstruction. The original site of the old factory was rebuilt and Tangshan cotton textile factory was built. After the mid-1990s, the cotton textile industry has entered an extremely difficult period after yesterday's glory, especially after entering the 21st century, Huaxin factory is even more difficult, the production and operation is deteriorating, and was forced to declare bankruptcy in 2006. So far, Huaxin factory, which has made many miracles, has exited from the stage of history with all kinds of helplessness, and is still and dusty in history.

3.2. Investigation on the Industrial Heritage of Huaxin Textile Factory in Tangshan

At present, Tangshan Huaxin Textile Factory has been listed in the list of disappeared industrial heritage. The status quo of material and intangible heritage preservation is not optimistic. The buildings and equipment of Huaxin Textile Factory in Tangshan city are not completely preserved due to the damage caused by the 1976 earthquake and the 1986 fire. Two thirds of the buildings were destroyed by the earthquake. After the earthquake, the factory buildings that did not collapse were reinforced and repaired, and a number of new factories were built. Huaxin Textile Factory in Fengrun new area was newly built in Yidi after the earthquake. Unfortunately, after the bankruptcy of the enterprise's buildings, part of the old plant area was sold in Tangshan steel plant, the other part was used for greening, and Huaxin Park was built. The workshop plants were not preserved, and the plants in Fengrun new area were also used for other purposes. What's more, the industrial equipment in the early stage of the construction of Tangshan Huaxin plant almost disappeared due to the factors such as earthquake, easy site construction, equipment renewal and the policy of limiting production and smashing ingots. Other machinery and equipment were auctioned after the bankruptcy of the enterprise, and they were also not preserved.

There are not many cultural resources left in Huaxin Textile Factory in Tangshan. At present, there is a large copper clock weighing 100 kg, a panoramic picture of the company's front door taken in 1920, a trademark of Sanyan in 1929 and some enterprise archives. See Figure 3 and Figure 4. Due to the earthquake, relocation and other reasons, the enterprise archives are seriously lost. In addition, Huaxin Textile Factory in Tangshan is broken After childbirth, the archives were not well kept for a period of time, which also caused damage to some of the archives. Huaxin company once made a request to the Tangshan Municipal Government for the transfer of the archives. After several setbacks, the enterprise archives were finally taken over by the Tangshan Municipal Archives Bureau.

It can be seen that the current situation of the industrial heritage of Huaxin Textile Factory in Tangshan is worrying and in a precarious situation. If it is not protected and utilized in time, the industrial heritage of Huaxin Textile Factory will be in danger of being lost. Therefore, it is urgent to rescue Huaxin Textile Factory, once a historical hero.

4. Tangshan Huaxin Textile Factory Industrial Heritage Protection and Reuse Mode

As mentioned above, the industrial heritage of Tangshan Huaxin Textile factory belongs to the industrial heritage of transformation and utilization. There are 7 such industrial heritages in Tangshan, accounting for half of the total, so it is particularly important for the rational reuse of such industrial heritages. On the basis of the space of industrial heritage itself, we can fully consider the full combination of industrial heritage and existing urban functions, such as combining urban parks, urban squares and other open spaces to design a new type of public activity area with historical and cultural value, increasing the attraction of the area to the citizens, so as to better play the urban memory transmission value of industrial heritage itself. Taking Huaxin Textile Factory in Tangshan as an example, the author puts forward several modes of protection and utilization of industrial heritage.

4.1. Establish Huaxin Textile Museum

A small "zigzag building" (the landmark building of Huaxin Textile Factory with zigzag side facade) will be built in the original Huaxin plant site, and a museum will be built to display Huaxin's cultural heritage resources, such as the remaining bronze bell, panoramic photos of the company, trademark patterns and enterprise files, so that the public can appreciate the

corporate culture and spirit of Huaxin plant, and strive to build Huaxin Textile Museum Set up a base for popular science and moral education.

In the museum, a corporate culture exhibition hall is set up, digital interpretation media is introduced, the historical context of Huaxin Textile Factory is displayed by using sound and photoelectric technology, the development history of the enterprise for more than 80 years is explored from the archives of Huaxin, and it is completely presented in the form of words and photos, which will reflect the pictures, operation scenes and equipment of industrial technology development level in different historical periods. The photos of workers' spirit, the great historical contributions that enterprises have made to the country and the materials that give back to the society are displayed. Take the development process of textile technology as documentary or film to present to the public, increase the public's experience of the cultural connotation of textile industry, and let the public fully understand the profound industrial history and urban context of Huaxin Industrial Museum.

4.2. Open up Industrial Culture Street

Tangshan is rich in industrial heritages. The banks of Douhe River and the surrounding areas of Dacheng mountain are the gathering areas of modern industry. Douhe river is called the mother river of Tangshan people, and Dacheng mountain is regarded as the birthplace of Tangshan city. Douhe river runs through the whole territory of Tangshan. Because of the convenient transportation and water use, many enterprises in modern Tangshan built near Douhe river. Tangshan Locomotive and rolling stock factory, Tangshan old railway station, Tangshan Ceramics Factory, Kailuan coal mine, Qixin Yanghui company and Tangshan Huaxin Textile Factory are gathered along the river. Qixin is located on the West Bank of Douhe River, while Huaxin is located on the East Bank of Douhe river. At present, the development of industrial heritages such as Kailuan and Qixin is based on the industrial civilization driving industrial tourism. Nanhu Park transforms the mining subsidence area of Kailuan into a public leisure landscape park through ecological means and landscape design scheme, realizing the transformation of mining wasteland with serious ecological problems into a mine park with beautiful ecological environment. Kailuan National Mine Park is built with industrial heritage such as industrial square, mining rail, abandoned roadway and mining equipment. The former site of Qixin cement plant has been transformed into China Cement Industry Museum and Qixin 1889 cultural and creative industry park. The park gives full play to the characteristics of the combination of industrial heritage protection and cultural creativity. The industrial park is built by the reconstruction of the old buildings such as 4-8 kiln system, wooden structure platform, old power plant and bath room built before 1943. It can be seen that the protection and reuse modes and Strategies of Kailuan, Qixin and other industrial heritages in the region have achieved considerable results.

The author thinks that we should integrate all kinds of industrial heritage resources in this area, load them into the tourism industry, carry out unified planning and design, take Dacheng mountain as the horizontal axis and Douhe River as the vertical axis, and in the third quadrant, build the industrial heritage gathering area along the Douhe River into the industrial heritage tourism area, and open up the industrial culture street. Specifically, "Qixin 1889" cultural and creative industrial park and open up Relying on Luan National Mine Park and earthquake site park, the industrial culture street running through six industrial sites along the Douhe River, including Huaxin, has been built. The industrial culture street has been built into a comprehensive area integrating tourism, catering, shopping, entertainment and leisure. Take Dacheng mountain as a link to connect several major landscapes, connecting tangtao, Qixin and Huaxin from west to East, and connecting urban planning exhibition hall, Tangshan Museum and Fenghuang mountain from east to west. In order to achieve a win-win situation of social and economic benefits in urban development, it is necessary to build a high-quality line of

industrial heritage tourism, promote the transformation and upgrading of tourism products, promote various business services such as surrounding culture, tourism, entertainment, shopping and leisure, and strive to build it into a new business card of Tangshan urban landscape.

4.3. Public Leisure Space Mode -- Transformation of Huaxin Theme Park

In the park, there are steles and statues. First of all, a monument in the shape of a spinning machine is set up in the park, which is placed in front of the landscape stone 50 meters away from the main gate of the park, engraved with the centennial history of Huaxin, recording the Centennial honor and disgrace of Huaxin. Secondly, the achievements of the sages show the sun and the moon, and do not forget their roots according to the source of their knowledge. They set up statues for the founders of Huaxin, engraved the stone pillars in the park with the statues of the elders such as Zhou Xuexi, Wang Xiaoting, Yang Shounan, Li Ximing, Zhou Shuchen, and attached with biographies to commemorate their contributions to the development of modern industry in Huaxin and even Tangshan. Thirdly, LED display is installed in the pavilion to display the names of the past directors of Huaxin Textile Factory and the employees who have made outstanding contributions to Huaxin Textile Factory in the form of mobile display. Finally, the important textile machinery and equipment are modeled and placed in Huaxin park. In a word, let the park truly become a park that concentrates the history and spirit of Huaxin, and let the industrial civilization of Huaxin pass on from generation to generation and last forever.

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