

The Elements Composition and Analysis of the Industrial-style Architectural Interior Decoration

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Keywords: Industrial-style, Architectural Interior Decoration, Elements Composition, Elements Analysis.

Abstract: The interior decoration form of industrial style is one of the important manifestation ways of modern architectural interior design. As the industrial-style interior decoration gradually becoming one of the hot spots of architectural interior projects, its evolution was characterized by the multiple elements and multiple types in terms of the expression mode, design method, and technique replacement. This paper explores the matched design methods for different modes of the industrial-style interior decoration. On one hand, based on the applications and practices of the industrial-style interior decoration, the evolution characteristics of form paradigms were teased out. On the other hand, the paper analyses the elements composition of the industrial-style interior decoration and presents a systematic construction guiding control mechanism with the compatible element organization.

1. Introduction

With the evolution and innovation of the industrial and technological revolution, the architectural interior decoration of industrial style has gradually become a new trend of interior design, which has affected people's life and living style. As an emerging carrier of industrial culture, its artistic form contains a large number of traditional industrial elements and shows three thematic patterns in the process of development and evolution: (1) Reshaping industrial aesthetics of the steam and electric industry revolutionary period. (2) Implanting industrial structures with heritage and craft. (3) Continuing the industrial context of restoration and renovation. On 17th July 2003, the Nizhny Tagil Charter [1], issued by The International Committee for the Conservation of the Industrial Heritage (TICCIH), established a milestone in the reconstruction and restoration of industrial heritage. The Charter proposes: the adaptation of an industrial site to a new use should respect the significant material and maintain original patterns of circulation and activity, and should be compatible as much as possible with the original or principal use. To a certain extent, it stimulated the design of industrial style from the external architectural form to the elements composition and expression of interior decoration. Since the industrial development in different historical stages has specific era characterizations, the industrial-style interior design always shows the characteristics of

multi-element, multi-object and multi-image, which can be divided into three prototypes: Industrial Heritage Reuse, Industrial Scene Reappearance, and Industrial Form Imitation.

Under the background of the new economic era, great changes have taken place in the industrial structure, which made the interior decoration of industrial style gradually transform from niche preferences into one of the mainstream modes of work and living interior decoration. However, there are still many problems with its actual space use adaptability. On the one hand, the impersonal mechanical characteristics of industrial-style interior deviate from the pursuit of ergonomic comfort in traditional interior design. On the other hand, the industrial-style interior design is lacking classified mode guidance and method guidance in the face of diverse and differentiated functional requirements. The extensive growth has greatly limited the quality upgrading of industrial-style interior and has also caused many problems such as imbalanced methods, nondurable forms, and unstable performance. Therefore, based on the review of historical evolution and the evaluation of paradigms in different stages, the development of a systematic construction guiding control mechanism with era characteristics, which can adapt to the diversified needs, has become the key to transformation and application of industrial-style interior design.

2. The Origin and Development of Industrial-style Architectural Interior Design

The Industrial Revolution brought human civilization into a new era. However, the factories built at that time were gradually abandoned with the develop of the third industry [2]. Until the 1970s, industrial buildings began to be transformed and reused in Europe and rapidly spread to the United States, Russia, Japan, and China. At the same time, the industrial nostalgic trend has also emerged. The industrial-style architectural interior has been gradually valued and adopted throughout the world. The design methods, spatial structures, and scene images of industrial style were constantly innovating, which has experienced three main stages in its transition and transformation: Pragmatism, Contextualism, and Expressionism (Figure 1).



Figure 1: The Evolution of the Industrial-Style Architectural Interior Decoration.

2.1. Pragmatism (the 1950s-1970s)

The pragmatic interior design utilized and transformed some waste factories and warehouses with low rent, huge space, and sufficient light into artistic living spaces and workplaces. During the renovation, only the internal space was re-divided and organized, and most of the original interior elements in industrial buildings were retained and reused. Taking Andy Warhol's "Factory Studio"[3] as an example, the renovation process was mainly necessary adjustments to the warehouse layout, and the addition of working equipment, while the key elements, structural frame, and colour composition of the original factory were well preserved and retained. Most of the early industrial-style interior design concepts were like this. They reused the original interior elements, adjusted the space appropriately, and pursued the maximization of practicability. It was a conservative interior design method, and therefore, to a certain extent, it lacked the refinement and detailed adaptation of industrial aesthetics.

2.2. Contextualism (the 1970s-2000s)

The contextualist interior design regards inheriting the industrial context as one of the important goals of interior design, rather than limited to the simple pursuit of practical interior renovation. In 1979, the Australian ICOMOS (International Council on Monuments and Sites) issued the "Burra Charter"[4], which proposed that adaptation must be limited to that which is essential to a use for the place. Compatible uses are those involving no changes, changes which are substantially reversible, or changes which have a minimal impact on the culturally significant fabric. Since then, in addition to the role of interior decoration itself, the industrial-style architectural interior decoration also became the memory carrier of the industrialization process which engraved the development process of industrial civilization. Designers would consciously add some industrial elements with a sense of history to highlight the industrial context. This change was a major innovation in the early industrial-style interior design.

2.3. Expressionism (after the 2000s)

The expressionist interior design initiatively took industrial-style imagery as a choice of interior design theme. Manhattan Loft Corporation (MLC), founded by Harry Handelsman in 1992, is the first corporation to initiatively adopt the industrial style in residential and office projects. Since then, the industrial-style interior design has been completely liberated from the large-span structure, becoming an independent and universal interior design. After that, industrial-style interior showed the characteristics of rapid development and widespread. On the one hand, the industrial-style interior design under project management has formed a complete design system, with universal design index and unified design concepts, and the style has been initially finalized. On the other hand, the industrial-style interior inherited the tastes of avant-garde artists and was gradually accepted and spread throughout the world. However, due to its style limitations, industrial-style interior in the city was mostly distributed in the form of dots or flakes, lacking a systematic application mechanism.

3. The Elements Composition of Industrial-style Interior Decoration

Industrial-style interior decoration develops in the collision between traditional culture and modern technology. The design bias determines that the industrial style has evolved into three interior prototypes. (1). The Industrial Heritage Reuse type replaces the internal functions of old industrial buildings based on retaining the integrity of the original structure and space and minimizes the use

of modern technology to preserve the original appearance of the industrial heritage. (2). The Industrial Scene Reappearance type uses modern interior decoration techniques to express the characteristics of old industrial-style interior and uses symbolic industrial elements to reconstruct the industrial culture and scene of the specific period. (3). The Industrial Form Imitation type takes the traditional industrial style as the template, through the use of new industrial materials and components, to construct a free, avant-garde, and personalized space. Tracing back to the roots, it can be found that these three industrial-style interior prototypes have the same design principle which is to retain or reconstruct the spatial experience of the industrial era, to highlight the value of its historical context, cultural emotion, and material function. Therefore, through modern architectural materials and techniques, the priority of industrial-style interior design is the skilful application and combination of various industrial elements, which could be divided into four aspects.

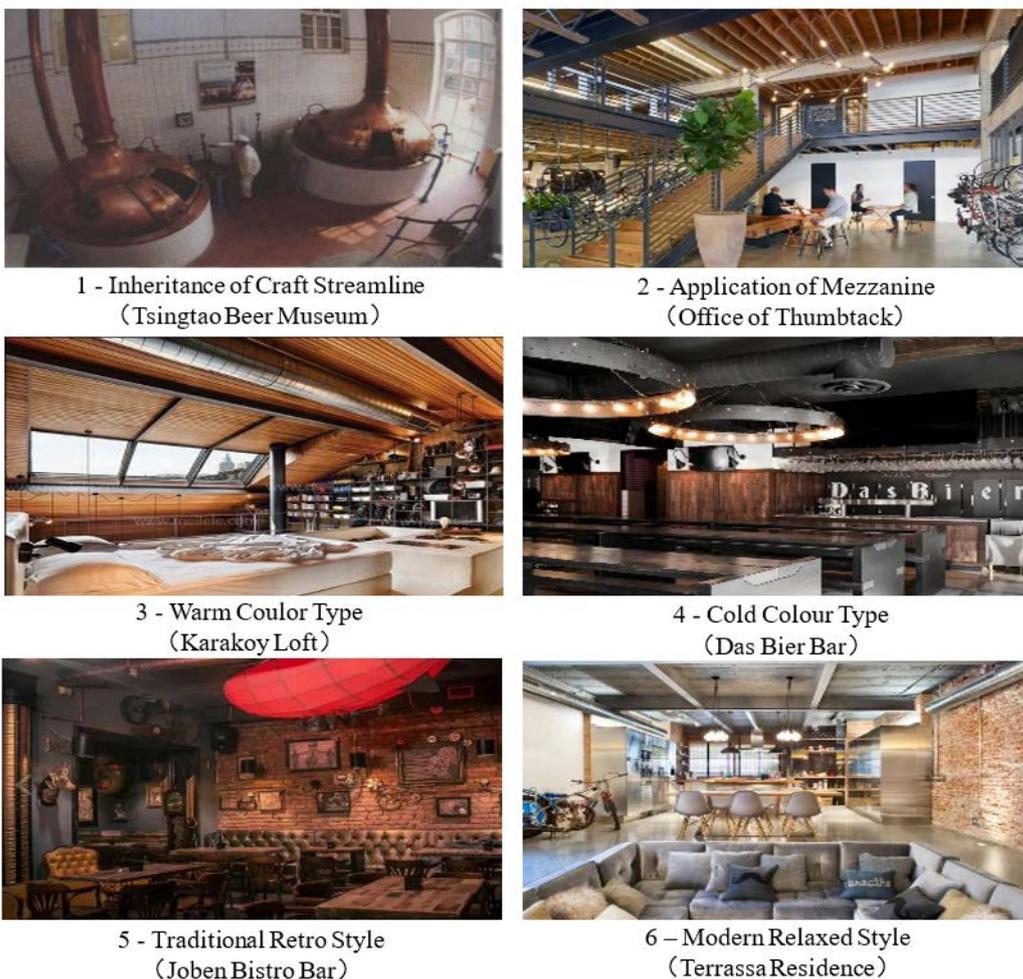


Figure 2: Typical Cases of Industrial-Style Interior Decoration Components.

3.1. Space and Streamline

Space and streamline organization of the industrial-style interior design is inseparable from its architectural form. Among the above three prototypes, the Industrial Scene Reappearance type and Industrial Form Imitation type both adopt modern interior design methods, and their spatial organization and streamline arrangement also meet the requirements of modern interior design. However, in the Industrial Heritage Reuse type, it is a common design method to carry out space

transformation and upgrading based on the original technological process [5] (raw material entering - raw material processing – goods production - assembly and packaging) of the old industrial building. For example, the Tsingtao Beer Museum (Figure 2-1] in China, which was transformed from the Tsingtao Brewery [6], reuses the production assembly line as the mainline for visit and tour, which not only reappears the beer manufacturing process but also reasonably arranges the exhibition streamline. Another example is the "9th Workshop of Chuanxiang Factory" theme restaurant in Shanghai China, which takes the period of the Great Production Movement as the background. Based on preserving the original streamline in the workshop, it transformed the reception office, administrative offices, and production workshop into the cashier, boxes, and dining hall. This industrial-style interior design method, on the one hand, meets the needs of modern space through the change of internal functions, on the other hand, inherits the heritage of industrial civilization through the preservation of original streamline, which is an effective combination of traditional industrial imagery and modern interior space.

3.2. Structure and Scale

To meet the requirements of the internal environment of production and processing, industrial buildings usually have the characteristics of large volume, transparent space, and spacious scale. As for the design of Industrial Heritage Reuse type, space, and structure reuse of old industrial buildings will inevitably lead to a functional scale that far exceeds the demand. To solve the problems of low interior comfort and waste of vertical space, the internal space can be combined, divided, reshaped, and expanded according to different functional requirements [7]. On the other hand, the Industrial Scene Reappearance type and the Industrial Form Imitation type usually expand the interior space to restore the original imagery of scale inside the industrial building, and the interior net height is generally 1.5-2 times of the minimum height specified in the code. Besides, the mezzanine structure is commonly used in these two types to improve the utilization factor of floor space and increase the utilization and richness of vertical space. Especially in the industrial-style interior design of residential and office buildings (Figure 2-2), the floor height is generally controlled at 4-6m, which ensures that there is enough vertical space to set mezzanine. With the perfect combination of function and form, the zigzag stair, the delicate metal handrail, and the rough mezzanine constitute an intriguing contemporary industrialized space.

3.3. Colour and Material

From the perspective of interior imagery, the industrial-style interior design is the representation of the industrial scene, which generally has the characteristics of grey colour, dense texture, rough material, and pure form [8]. In the industrial-style interior decoration, different material textures (brick, concrete, steel, asphalt) and colour vision (grey, crimson, brown, iron red, black) can be combined to form diverse interior imagery types. The Relaxed Warm Colour type (Figure 2-3) is mainly made of light materials such as wood and red brick, with a warm colour background, which weakens the inherent roughness of industrial-style and is suitable for static functional spaces. A typical example of this type is the Karakoy Loft built by the Ofist team in 2014, it adopted a wooden ceiling to cooperate transverse long windows, creating a comfortable, warm, concise, and lively atmosphere. The Rough Cool Colour type (Figure 2-4) is mainly made of thick materials such as metal and concrete, with a dark colour background, which strengthens the uncontrollability of industrial-style and is suitable for dynamic functional spaces. Taking the Das Bier Bar designed by Humà Design + Architecture in 2016 as an example, the chandeliers made of perforated hot-rolled steel plates, combined with terrazzo floor and stone facade, created a cool German "Bierhall"

industrial-style interior decoration. On the whole, the combination of material properties and colour tone leads to the different imageries of industrial-style interior decoration.

3.4. Furnishing and Decoration

The retro-style furnishing and decoration are not only the visual focus of industrial-style interior design but also the visual carrier of industrial imagery. Their various and compatible components can be combined into different mixed effects in different types of interior design. The traditional retro style [Figure 2-5], aims for expressing industrial reminiscence, usually uses wrought iron, electrical appliances, and other retro furnishing and decoration to increase the flavour of the old industry to create the scene of the industrial age. The modern relaxed style (Figure 2-6), aims for expressing an industrial preference, usually uses fabric, wood, leather, and other furnishing and decoration to weaken the thick texture to create a more personalized and relaxed modern interior. Besides, the industrial-style interior furnishing and decoration also have two symbolic features. a). Mechanical equipment also has interior decoration function, such as the exposed pipelines on the ceiling is one of the common decoration components. b). Old and rusty objects are often used as the main decoration components to increase the sense of age, which is one of the common ways of visual expression in industrial-style interior design [9]. The S Construction Office in Bangkok built by Metaphor Design Studio in 2015 is a successful case of industrial-style interior furnishing and decoration. The designer retained the operation equipment, workbench, assembly line, and other facilities of the steel plant, and then added leather furniture, making it the highlight of the whole interior space.

4. Adaptable Guiding Control Mechanism of Industrial-style Interior Decoration

The imagery creation of the industrial-style interior design is mainly reflected in the adaptation of industrial theme and functional space. Based on the review of the evolution process, and the analysis of elements composition, this paper proposes the guiding control strategies of industrial-style interior decoration for imagery creation and space optimization. From an empirical point of view, in addition to the stylized spatial analysis, the industrial-style guiding control mechanism must also pay attention to avoiding the indiscriminate application of empirical mode. The key lies in the imagery created with trade-offs.

4.1. Distinctive Space Theme

The industrial-style interior design is distinguished from the other interior design with its unique space decoration based on industrial preference and context. In its space decoration, the original industrial style should be strengthened as much as possible, and other styles should be avoided to prevent the mixing and weakening of the spatial imagery. To realistically reappear the industrial scene, the industrial-style interior design should, to the greatest extent, preserve industrial facilities, add industrial components, refine industrial imagery, build functional adaptable space, and highlight the individuality of the industrial scene. The Exhibition Hall of Evidences of Crime Committed [10] in China designed by Ni Yang is a typical case with a distinctive space theme. The dim and rough industrial-style interior decoration creates a solemn and dreary atmosphere, which highlights the cruelty of crime and stimulates the emotional resonance of visitors.

4.2. Differentiated Imageries Creation

Through the contrast between soft materials and thick instruments, and the collision of warm and cold tones, the differentiated place characteristics of industrial-style are created. It is worth noting that the industrial-style interior design must be based on the actual situation to avoid extensive and indiscriminate application. For example, designers should pay attention to the division of interior space, use soft partitions to enclose suitable scales in areas where people use and stay for a long time, and add warm colour furnishings and decorations to maximize comfort and easiness. On the contrary, in the spaces which are not directly in contact with people but are only used as imagery expression, designers could use thick partitions to strengthen the boundaries of the spaces, add exaggerated cold colour industrial components, and place industrial symbols at the nodes. Through the differentiated design of interior space, the industrial-style imagery that can accommodate different functions is created.

4.3. Logical Streamline Concatenation

As for the organization of interior streamline, industrial logic should be used to integrate various elements of interior decoration and connect different interior imageries. Industrial logic includes contextual logic and behavioural logic. The contextual logic is based on the time sequence of industrial evolution or relying on the spatial sequence of the original production assembly line, to achieve the compatibility of interior function and decoration. The behavioural logic takes the continuity of human perception as the key point, connecting the space streamline in an integrated way. For example, the Haier Corporate Culture Museum in Tsingtao China, which was transformed from the Haier Mould Workshop, took the development history of the company as the contextual logic, designing industrial-style interiors suitable for different historical stages, and took the exhibition experience as the behavioural logic to organize the space streamline, connecting the exhibition halls in a sequential, hierarchical and logical way.

4.4. Balanced Value Adjustment

In the design of industrial-style interior decoration, designers should pay attention to the balance and adjustment of its functional value, imagery value and emotional value, and take the following points as the design criteria. a). When the functional requirements conflict with the imagery creation, designers should give priority to the space function and appropriately give up imagery and emotional value. b). Designers should comprehensively consider and evaluate factors such as the number of users, the scale of the space, the appropriate imagery type, etc., and design in a targeted manner to maximize the imagery value of industrial-style. c). Designers should pay attention to the different characteristics presented by different prototypes, and selectively use materials, colours, furnishings, and decorations to highlight the advantages and weaken the shortcomings. To sum up, industrial-style interior design should take functional adaptation as the basic point, adding concepts of practicability, suitability, humanity, and characteristics, to achieve balanced growth of various values.

5. Conclusion

Based on the background of industry transformation and technology innovation, this paper teases out the development history and evolution motivation of industrial-style interior decoration and concludes three paradigms of Pragmatism, Contextualism, and Expressionism. Then, this paper discusses the application of industrial-style interior elements in different interior prototypes from

four aspects: space and streamline, structure and scale, colour and material, furnishing and decoration. Finally, to guide the overall ambiance, layout arrangement, and detailed construction of different industrial-style interior imagery types, this paper proposes an adaptable guiding control mechanism. Nowadays, the industrial-style is not only a decorative style but also a medium of contemporary architecture and industrial culture. However, in practice, there is still much room for improvement in the expression of place spirit and the reappearance of the historical scene [11]. Therefore, the industrial-style interior design should create diversified characteristic experiences while arranging functions and establish an organic connection between industrial imagery and modern functions.

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