

Industrial Tourism in China's Intelligent Factories: Emergence, Modes, and Constraints

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Abstract: Industrial tourism can be categorized into industrial heritage tourism and modern industrial tourism. Over the past few years, China has witnessed a new type of industrial tourism that focuses on smart factories. Visitors arrive to see how the production process is done, learn about it and experience it by doing so. The present article employs three case studies: Xiaomi Auto Factory, Haier Intelligent Manufacturing Experience Space, and BY-HEALTH Transparent Factory as starting points to trace the emergence of intelligent factory tourism and examine its working mechanisms and limitations. Three key factors have an impact on the evolution of intelligent factory tourism in China, namely, the alteration of consumer demand, institutional support, and corporate strategy. There are currently three models; attracting attention through visits; Incorporating visits into the ecosystem; Build trust through transparency. Nevertheless, every model has its own contradictions. The demand of visitors may be high than the production capacity and hence it is hard to balance between openness and confidentiality and production order and tourism services are not necessarily coordinated. To demonstrate the selective display of the production process by enterprises, this paper presents the notion of production visibility.

Keywords: Industrial Tourism; Intelligent Factory; Smart Manufacturing; Production Visibility

1. Introduction

The studies on industrial tourism are primarily based on heritage sites, such as old factories turned into museums or cultural areas [1,2]. Factories which continue to produce and are open to the public are given less attention. A good example is intelligent factories. Today, most of the factories in China have embraced smart systems and started welcoming tourists.

Visitors will be able to participate in guided tours, branded events, and scientific experiences. They were drawn by the intelligent production experience on-site, rather than industrial memory. The robotic arm swings before the visitors. Information is transmitted in real-time via digital screens. Production lines work in unison. These factories do not only manufacture products but also enable visitors to see how modern manufacturing really works with their own eyes.

The current studies on Industry 4.0 and smart manufacturing primarily concentrate on technology and efficiency [3-6]. Smart factories are not often regarded as open showrooms. This article picks three cases, Xiaomi, Haier, and BY-HEALTH, and discusses them based on three questions. What is the origin of smart factory tourism? What are its existing models of practice? And what have been the factors that have restricted its development? This paper holds the view that intelligent factory industrial tourism is not merely a mere enterprise open tour, but a spatial reorganization process [7]. Various reasons contribute to this process: shifting consumer needs, government policies, and businesses developing their strategies [7]. Companies selectively open up sections of the production process and make the manufacturing process visible and enable people to experience it themselves. In conclusion to this mechanism, this paper presents the notion of production visibility.

2. Literature Review and Analytical Framework

There are two types of industrial tourism research. Other researchers work on the preservation of industrial heritage and post-industrial urban transformation [8]. The other category of research is based on working factories. The important thing is how these facilities are open to the public. Intelligent factory industrial tourism is obviously a part of the latter, however, it is not similar to the overall

idea of open factories. It is based on automated production lines and robot cooperation that has a high potential of visibility [5,6].

This phenomenon must also be viewed in the light of experience economy. Research on experiential economy indicates that economic value is achieved by means of experiential processes which are designed and structured [9]. Tourism studies reveal as well that the current tourists are not contented with mere sightseeing. It is important to them to get involved. They also appreciate learning opportunities and would like to share their experiences [10,11]. Industrial tourism can make the production process an experience and a consumption by enterprises. The place of production ceases to be an efficiency space within. It has also turned out to be a significant brand communication and technical image building interface. The factory communicates brand value, emphasizes product quality, and enables visitors to feel technical capabilities [12].

In this article, the author presents the idea of production visibility, that is, businesses selectively and systematically open their production processes to the public. What is presented can be clearly seen and understood by visitors. The internal production processes are converted into objects visible to the public. There are three characteristics in the concept. To begin with, restricted transparency. All will not be shown. Second, it is dependent on the organization of the visit. Routes, interpretations, and display installations all have significant roles. Third, the manufacturing process needs a story that would redefine how people view the factory. This makes production an unforgettable experience. This concept is applied to intelligent factory tourism in the following analysis.

3. Research Design

This paper is a qualitative multi-case study [13]. One case study cannot capture the entire picture, and it cannot differentiate between enterprise-specific practices and general trends. It assists in determining different cross-industry patterns by comparing several cases. This case choice is based on three criteria Xiaomi Auto Factory, Haier Intelligent Manufacturing Center, and BY-HEALTH Transparent Factory. The three are in various industries. Xiaomi makes cars, Haier makes household appliances and BY-HEALTH makes health products, with varying business logics. There was a difference between the three

regarding open maturity and policy certification. Corporate information, policy documents and media reports were used in this study. Corporate information assists us to have a clear picture of the internal structure and positioning of the case. The institutional environment is described in policy documents. Media coverage complements social spread and societal interest.

4. The Emergence of Intelligent Factory Tourism in China

There are several forces contributing to the development of intelligent factory industrial tourism in China. Consumers are demanding, institutions are becoming more supportive and companies are changing their strategies.

Visitors today are not contented with mere sightseeing. They want to be engaged and learn something and they will share these experiences with others [7,9-11]. Smart factories are ideal in this trend. They open up areas that have been closed to the general public and enable visitors to view automated production lines and robotic arms at work. These attractions are new and different, with learning value and impressive visual effects. They are not such tourist attractions as traditional ones, but rather real-time exhibitions of contemporary production activities. An increasing number of families, school groups, and tech enthusiasts are opting to make such visits.

Driving role has also been played by policy measures. One of the steps towards more coordinated development in this field was the release of the "National Industrial Tourism Demonstration Base Standards and Evaluation" in 2017 [14]. Shortly thereafter, additional policy documents were released one after another. The "Implementation Plan for Promoting the Development of Industrial Culture (2021-2025)" and the "Tourism Development Outline of the 14th Five-Year Plan" are two key documents that embed industrial tourism into a larger policy context [15,16]. Several batches of national industrial tourism demonstration bases have been created throughout the country between 2017 and 2023 [17]. Later on, local governments and different ministries in turn came up with their own initiatives, emphasizing the culture and service quality of industries, and experimenting with methods of transforming production areas to accommodate visitor needs [18-20].

The foundation of industrial development is

demand and policies, but it is the enterprises that make the final decision on whether to open up. To most firms, it is a very important aspect of displaying their image. Other companies establish their brands and retain customers by being open. Technology demonstrations are also quite widespread, with some companies employing this to showcase their production benefits. Some companies go an extra mile by enabling tourists to experience the quality control process themselves so as to alleviate consumer worries. There are different approaches taken by different industries. Companies that are brand-oriented lay more emphasis on communication and user relationships. Factory openness in technology-intensive industries emphasizes manufacturing power and innovation potential. Factory openness in quality-sensitive industries puts more focus on transparency and quality communication in quality-sensitive industries [7]. These decisions have led to different types of intelligent factory tourism. It is not the fact that factories themselves should be opened; what matters is what advantages companies expect to get out of them. Various logics of openness are therefore developed by different enterprises.

5. Operational Modes: Three Cases

5.1 Publicity-Amplification Mode: Xiaomi's Automobile Factory

Xiaomi is a late entrant in the automotive industry. Xiaomi must not only demonstrate its ability to design cars, but also to produce cars in large quantities and of high quality. It is against this background that opening a factory becomes a brand event with a high degree of presence and communication power. In 2024, the factory was chosen to be included in the list of Beijing Industrial Tourism Demonstration Sites. Visitors will be able to book admission tickets, give guided tours through the exhibition hall, tour around the workshop and test drive vehicles [21-23].

This model turns production into a publicity. The lack of visitor spots, the popularity of reservations and social media discussions further increased the worth of the openness of the factory. Xiaomi was able to attract the attention of the masses very fast, enhance brand recognition, and even create public interest much beyond its actual reception capacity. However, there are disadvantages of this model as well. It

is based on media coverage and popular interest, where demand is always greater than reception capacity and booking pressure is consistently high. The factories in these places are not merely production locations, but a structured spectacle that has been influenced by the attention of the people.

5.2 Ecosystem-Embedded Mode: Haier's Intelligent Manufacturing Experience Space

Haier offers a more open and systematic logic. Its openness to factories is part of a larger narrative, becoming part of the narrative of "intelligent manufacturing - industrial internet - smart living". Haier has created an experience system from the factory to the user end. Its visibility includes lighthouse factories, industrial internet platforms and smart home scenarios [24,25].

Haier wants to be the embodiment of the overall system value. The visitors observe how businesses use digital capabilities to bridge smart manufacturing and living space of users. Factories are transformed into portals to bigger ecosystems.

This model provides a better strategic continuity and opens up more room to develop the visitor experience. But it is also an obvious challenge. The more systematic the narration, the more abstract and difficult it will be to comprehend by ordinary visitors. To a large extent, its success will be determined by the quality of the translation, route design, and how the experience is presented.

5.3 Transparency-and-Trust Mode: BY-HEALTH's Transparent Factory

The open logic of BY-HEALTH transparent factories is based on transparency and trust. The health products industry is unique in that it is difficult for consumers to easily assess product quality from its packaging. Consumers place a high value on the trustworthiness of production processes, traceability of raw materials and testing procedures. "Verifiable quality" can be communicated through open factories [26-28]. The visit to the visualized workshop, the demonstration of the inspection process and the interactive experiences all contribute to a sense of "verifiable quality". Here, transparency is more of a peace of mind. Its strength is that it's in sync with the trust-driven health products industry. But when transparency becomes public, expectations are raised and companies must keep

delivering on this promise.

5.4 Comparison of the Three Modes

The cases of these three works in different ways. Xiaomi has opened up its factories to create brand awareness, making the manufacturing location a public spectacle. Haier incorporates factory tours into more general stories about smart production and everyday life. BY-

HEALTH is a company that is very sensitive to trust, therefore, transparency helps it to reinforce its commitment to quality [7]. Even though they all had their own strategies, they had one thing in common: selective disclosure of production processes, visible spaces of factories. This is precisely what production visibility is in fact [12]. Table 1 compares these three models.

Table 1. Comparison of Three Operational Modes of Intelligent Factory Tourism

Dimension	Publicity-Amplification Mode (Xiaomi's Automobile Factory)	Ecosystem-Embedded Mode (Haier's Intelligent Manufacturing Experience Space)	Transparency-and-Trust Mode (BY-HEALTH's Transparent Factory)
Core driving force	Brand attention and media amplification	Corporate strategic narrative and ecosystem display	Quality communication and consumer trust building
Display focus	Automation level, manufacturing efficiency, and technological advancement	Intelligent manufacturing, industrial internet, and smart- life scenarios	Quality control, traceability systems, and transparent production
Target audience	General public, brand users, technology enthusiasts, and families with children	Tourists, study-tour groups, industry observers, and business clients	Consumers, partners, study- tour groups, and regulatory stakeholders
Logic of openness	Communication effects generated through high popularity and scarcity	Extension of factory opening through a systematic narrative	Reduction of quality uncertainty through visible production
Relationship with institutional support	Market attention precedes institutional recognition	Closely aligned with policy directions on intelligent manufacturing and industrial upgrading	Institutional endorsement obtained through demonstration-base recognition and similar certifications
Dependence for sustainability	Continued brand popularity and organizational capacity for visits	Strategic continuity, interpretive systems, and sustained investment	Credibility of transparency commitments and maintenance of service experience
Main limitation	Demand far exceeds reception capacity, creating persistent reservation pressure	Narrative is relatively abstract, requiring strong interpretation and experience design	Expectations of transparency continue to rise, increasing operational and maintenance costs

6. Developmental Constraints

There are three key limitations of intelligent factory industrial tourism in its development.

Shortage of supply-demand. The intelligent factory was initially aimed at enhancing the efficiency of production, rather than accommodating masses of tourists. When a factory gets popular then the number of reservation slots will be more than supply and reception capacity will become a bottleneck.

The paradox of openness and confidentiality. Modern technology usually translates to more secrecy, with fundamental processes, data systems and operational workflows all at play [4,6]. These trade secrets or intellectual property are usually guarded by factories. Factories are

not totally open and transparent. It is the responsibility of companies to determine what information they will disclose and what they will keep secret.

Conflict between production order and tourism services. There are priorities of production systems. The first is efficiency, then discipline and risk control are also important. Travel services assume a different approach. Those lay more stress on accessibility and quality of experience. To have these two logics in the same space, additional effort must be put. The routes of visitors should be organized and provided with guide systems and security [20].

Smart factory industrial tourism must be able to sustain a constant balance in the face of various conflicts. This is not only an addition of a tour

route, but a re-invention of the whole production space.

7. Conclusion and Discussion

This paper presents Xiaomi, Haier, and By-Health as case studies to discuss the emergence, patterns, and limitations of intelligent factory industrial tourism in China. The findings of the research indicate that it is not a mere continuation of the conventional industrial tourism, but an entirely new spatial practice. Both have contributed to change in consumption patterns and institutional support. It is also greatly influenced by corporate strategy.

This paper changes the research focus of heritage sites to working factories with advanced technology and brings about the idea of production visibility. In the case of Xiaomi, being visible is a way of gaining attention. In the case of Haier, it is one of the methods of narrating the bigger picture of the ecosystem. BY-HEALTH employs it to personify quality and reliability. Being visible does not mean being transparent and open; it is also a strategic instrument. It is through it that enterprises put value on communication on production activities. The current study was based on secondary data and did not go into the visitor experience or regional variations. Interviews and visitor surveys can be used in future studies. Nonetheless, these cases remain to be valuable. As a special form of development in the sphere of industrial tourism, intelligent factory tourism is worth thorough investigation.

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