

Research on Management Innovation Strategies in Macau's Hotel Industry: Based on the Pest Model

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Keywords: PEST Model/Macau/Hotel Industry/Management Innovation.

Abstract: Under the dual driving forces of global tourism transformation and the construction of the Guangdong-Hong Kong-Macao Greater Bay Area, Macau's hotel industry is undergoing a strategic transition from a single-pillar industry to a diversified economy. This paper constructs a four-dimensional innovation framework of "policy responsiveness, market-driven initiatives, cultural integration, and technological empowerment" based on the PEST model (Political, Economic, Social, Technological), systematically exploring the practical pathways and theoretical value of management innovation in Macau's hotel industry. The study reveals that the innovation practices of Macau's hotel industry are essentially a co-evolution of corporate dynamic capabilities and government institutional embedding, offering analytical insights for the transformation of global gambling-oriented economies. Through case studies of Sands China and Wynn Macau, this paper provides theoretical tools and practical analyses for the post-pandemic upgrading of Macau's tourism industry.

1 INTRODUCTION

Macau, renowned as the "Oriental Las Vegas," is a globally renowned tourist destination. Driven by the gambling industry, the hotel industry in Macau has achieved leapfrog development. However, some issues have also emerged. For instance, there is the problem of the economic structure transitioning from a single gambling - based model to a diversified economic ecosystem. Geopolitically, it faces the challenges of decreased competitiveness due to the "multi - centralization" in the Guangdong - Hong Kong - Macau Greater Bay Area and the rise of competitors in Southeast Asia. Moreover, there are issues of diversified demands resulting from the iteration of consumer groups and the rise of the experience economy (Guo & Liu, 2009).

In recent years, under the impetus of the construction of the Guangdong - Hong Kong - Macau Greater Bay Area and the positioning of "World Tourism and Leisure Center," the Macau Special Administrative Region Government has been actively promoting industrial diversification, tax incentives, and talent - introduction policies to support the long - term development of the local tourism industry. As a pillar industry, the hotel industry also needs to enhance its core competitiveness through

management innovation (Li, 2020). A systematic analysis of the external environment of the Macau hotel industry based on the PEST model (Political, Economic, Social, Technological) not only helps to identify the key driving factors for the development of the industry but also provides a scientific basis for formulating management innovation strategies, which has important practical value for the sustainable economic development of Macau.

Existing research mostly focuses on the single - dimension innovation of the hotel industry (such as service models and marketing strategies), while there are still deficiencies in the integrated research from a macro - environment perspective. This paper will adopt the literature analysis method and case - study method. Combining the practical experiences of representative enterprises such as Sands China Ltd. and Wynn Resorts, it will analyze the feasible paths of management innovation from the four dimensions of PEST and construct a development framework for the hotel industry with regional characteristics.

2 ANALYSIS OF THE DEVELOPMENT STATUS OF MACAU'S HOTEL INDUSTRY

2.1 Industry Overview

According to the official data of the Macau Government Tourism Office, as of 2023, the total number of registered hotels and apartments in Macau has reached 143, with a guest room supply of over 46,000. A competitive landscape has taken shape, mainly featuring integrated resorts and supplemented by independent hotels (Chen, 2024). Hotels affiliated with the six major gaming enterprises in Macau contribute more than 70% of the total number of guest rooms. Their integrated operation model of "gaming + hotel + entertainment" endows them with an absolute market advantage. On the other hand, local independent hotels in Macau focus on niche markets and attract non - gaming customer groups with boutique and themed services, yet their overall market share remains relatively low.

2.2 Existing Challenges

With the development and expansion of Macau's tourism industry, several prominent issues have emerged in the hotel industry.

Firstly, there is the problem of product homogenization. Data from the Statistics and Census Service of Macau indicate that among Macau's high - end hotels, approximately 68% offer similar service portfolios that include casinos, swimming pools, and duty - free shops. This has led to the non - gaming revenue accounting for less than 40% in the long - term. Moreover, the resultant price war has caused the average room rate of five - star hotels in Macau to decline by 23% in 2022 compared to 2019.

Secondly, there exists an issue of uneven human resources structure. The hotel industry in Macau is currently confronted with a dual dilemma of "shortage of high - end talents and loss of grassroots employees". According to an investigation by the Labour Affairs Bureau of Macau, less than 15% of hotel management personnel have experience in digital transformation. Meanwhile, the annual turnover rate of room service positions is as high as 35%, and the proportion of labor costs in the total operating costs has increased to 42%. As a result, the hotel operating costs are continuously rising while the service quality has not been significantly improved.

Thirdly, there is the problem of sustainable development (Wan, Chan & Huang et al., 2017). A

report by the Guangdong - Hong Kong - Macau Environmental Protection Alliance shows that the energy consumption of the hotel industry in Macau accounts for 18% of the city's total electricity consumption, and its carbon emission intensity is 12% higher than that of Hong Kong. With the international regulations such as the European Union's "carbon border tax" exerting pressure, the industry is facing substantial financial pressures brought about by the green transformation.

3 MACRO-ENVIRONMENTAL ANALYSIS BASED ON THE PEST MODEL

3.1 Political Factors

Against the backdrop of policy coordination in the Guangdong-Hong Kong-Macao Greater Bay Area, the hotel industry in Macau is deeply benefiting from the dividends released by policy linkages. The newly revised Gambling Law in 2022 clearly stipulates that licensed enterprises are required to increase the proportion of non-gambling investments to 10%. This policy adjustment has had a profound impact on the development of the industry. Represented by enterprises such as MGM, they have successively increased their investment in other types of art activities such as art exhibitions.

From the perspective of industrial layout, guided by policies, a large amount of non-gambling investment has poured into local cultural heritage projects in Macau. This shift in the investment flow not only enriches the connotation of Macau's tourism industry but also strongly promotes the reconstruction process of the "culture + accommodation" value chain. By deeply integrating cultural elements into hotel accommodation services, the enhancement of industrial added value and the innovative development of industrial forms have been achieved.

In addition, under the coordinated effect of Macau's government tourism promotion policies and the convenient cross-border customs clearance policies implemented by the Zhuhai government, the occupancy rate of hotels in Macau during non-holiday periods has been significantly increased. This change in data reflects, from the side, the positive role played by government policies in stimulating tourism consumption and optimizing the structure of the tourism market, providing strong support for the sustainable development of Macau's hotel industry. At the same time, it also provides practical examples

and policy references for the coordinated development of regional tourism economies.

3.2 Economic Factors

Under the profound influence of the COVID-19 pandemic, the global tourism industry has suffered a heavy blow. The tourism industry in Macau is currently in the process of tourism revival. The dynamic changes in the industrial scale in the post-pandemic era have gradually shown a shrinking trend in their impact on the hotel industry (Guo, 2021). Since 2023, the tourism industry in Macau has made remarkable progress in recovery. Throughout 2023, the number of overseas tourists has recovered to 65% of the level in 2019.

The hotel industry in Macau generally presents an oligopolistic market structure, with its main target customer groups being middle and high-end customers. However, the decline in the proportion of high-end customer groups has prompted many hotels to launch mid-range product lines featuring "suites + recreational programs" as a strategic adjustment to cope with market changes. The dependence on tourist sources and fluctuations in currency exchange rates also affect people's enthusiasm for traveling to Macau. The proportion of mainland tourists in the total number of tourists in Macau has continuously exceeded 68%, and this group is significantly affected by visa policies and exchange rate fluctuations. The fluctuations in the exchange rate between the Chinese yuan and the Macau pataca will lead to a decrease in tourists' willingness to shop. Based on this, Galaxy Hotel has implemented a policy of offering fixed discounts for prepaid Chinese yuan, aiming to effectively offset the adverse impacts brought about by exchange rate fluctuations.

In the field of convention and exhibition activities, the number of convention and exhibition activities in Macau in 2024 has exceeded the level before the pandemic. MICE (Meetings, Incentives, Conferences, and Exhibitions) customers have contributed nearly 30% of the hotel revenue, becoming one of the important sources of hotel revenue. In terms of public transportation, the opening of the Macau Light Rail Transit line has had a positive impact on the hotels along the line, and the completion and opening of the Hong Kong-Zhuhai-Macao Bridge have gradually extended the average length of stay of tourists from Hong Kong in Macau. Diverse tourist sources and demands have effectively promoted the transformation of the hotel industry in Macau from "gambling dependence" to "revenue diversification" (Ahmat, Rahamat & Arendt et al., 2021).

However, during the transformation process, the imbalance between the cost structure and revenue management is inevitable. In terms of costs, the proportion of labor costs has climbed to 44%, and the hourly wage of grassroots employees has increased by 58% within five years, but labor productivity has only increased by 12%. In addition, affected by the global energy crisis, the daily energy consumption cost per guest room has reached 18.7 US dollars, representing a 67% increase compared to 2019. In terms of revenue management, the hotel industry in Macau has problems such as insufficient data integration and lagging algorithms. These issues are complex and intractable to a certain extent and are difficult to be effectively solved in a short period of time.

3.3 Social Factors

The consumption preferences of tourists in Macau are changing. The proportion of Generation Z tourists has increased to 37%. The growing "check - in" demands have driven the Lisboa Hotel to transform its historical suites into "retro photography live - streaming rooms". The playback volume of related topics on Douyin has exceeded 200 million times. In contrast, the middle - aged and elderly groups are facing a technological divide.

The protection and development of cultural heritage also have a positive impact on Macau's tourism industry. After the Historic Centre of Macau was inscribed on the UNESCO list, the hotel industry has shown a trend of "Museumification". However, the inevitable increase in restoration costs and the not - necessarily - significant effects at the value - creation level mean that how to reconstruct the cultural identity of Macau in people's minds is also a factor that the hotel industry needs to consider. For example, the "Macanese Cuisine Festival" held by MGM attracts about 230,000 tourists every year, rejuvenating endangered culinary skills and promoting cultural construction through an innovative festival.

In addition, the value conflicts of cross - border tourist sources have also impacted the Macau tourism industry (Chen, 2019). The proportion of tourists from the Middle East and Southeast Asia is gradually increasing, and different cultural needs require the hotel industry to innovate its management model. The protests from local communities against tourist overcrowding are on the rise. The issue of how to better protect the rights and interests of local residents will also have a certain impact on the preferential government policies for the Macau hotel industry in the future.

3.4 Technological Factors

Macau's technological environment is undergoing digital transformation. In terms of hardware facilities, the 2023 annual report of Sands China shows that hotels in Macau have achieved full 5G network coverage, and the coverage rate of in-room intelligent terminals is as high as 82%. However, the related software is diverse, and most of the suppliers are from different overseas countries, resulting in a relatively high data sovereignty risk (Xu et al., 2023).

In terms of other emerging technologies, technologies such as blockchain and extended reality have gradually been piloted successfully. For example, The Londoner Macau launched Meta Avatar customer service, reducing the cost of hiring human customer service. Marriott Hotel used VR for crisis simulation drills, and the pass rate of employees' emergency response ability assessment increased from 61% to 92%. The application of diverse technologies has continuously improved the accommodation experience of the hotel industry in Macau.

However, at the same time, the application of technology also faces gaps on both the enterprise and user sides. The technology investment of leading hotels is 17 times that of small and medium-sized hotels, leading to a continuous expansion of the service-capacity gap. This also makes users more inclined to choose leading hotels when selecting accommodation, and the drawbacks of technology have instead worsened the market environment.

The reconstruction of the technology ecosystem still requires substantial investment and cooperation from the hotel industry. For example, the "Smart Hotel Laboratory" jointly established by Macau University of Science and Technology and Sands China, as well as the "Macau Hotel Technology Alliance" jointly founded by Macau hotels, reduce the development costs of small and medium-sized hotels through the sharing of open-source technology communities.

4 CONSTRUCTION OF THE MANAGEMENT INNOVATION STRATEGY SYSTEM

4.1 Policy-Responsive Innovation

In the national strategic layout, the construction of the Guangdong-Hong Kong-Macao Greater Bay Area, as an important measure to promote regional

coordinated development, has brought unprecedented opportunities for the development of the hotel industry in Macau. Driven by this policy, the hotel industry in Macau is undergoing a profound transformation from an "isolated gambling city" to a "node in the Greater Bay Area". How to leverage the support of the integrated development policy of Guangdong, Hong Kong and Macau to achieve its own sustainable development has become the core issue for the future development of the hotel industry in Macau.

Taking the innovative cooperation between Sands China and Hengqin, Zhuhai as a typical case, the two parties jointly established a joint training base, sending Macau employees to Zhuhai for digital operation training, which effectively improved the employees' professional skills and business capabilities. At the same time, the linen supply efficiency of the Hengqin Warehousing Center has tripled, greatly optimizing the supply chain management. This cooperation model of "Macau service + Hengqin space" not only realizes the optimized allocation of resources but also significantly reduces the room costs and improves the economic benefits of enterprises. In addition, according to the Overall Plan for the Construction of the Guangdong-Macau In-depth Cooperation Zone in Hengqin, hotel enterprises participating in regional collaboration can enjoy a 15% income tax preferential policy, which further enhances their competitiveness and development impetus.

Wynn Macau has actively seized the policy dividends and established a cross-border convention and exhibition service center in Hengqin. In 2023, it successfully hosted 12 international conferences. This achievement not only reflects the positive role of policies in promoting the development of the hotel industry but also demonstrates the potential and advantages of the hotel industry in Macau in the international convention and exhibition field, providing useful references for the hotel industry in Macau to expand diversified businesses.

Facing the contradiction between the growing talent demand and the huge talent gap in the hotel industry, the Labour Affairs Bureau of Macau and the Macau Institute for Tourism Studies jointly launched the "Smart Hotel Manager" certification program, incorporating cutting-edge technologies such as AR device operation and big data analysis into the required courses to cultivate professional talents who meet the needs of the digital era. At the same time, they have cooperated with the University of Macau to establish the "Tourism Technology Laboratory" to carry out targeted talent cultivation, providing strong

talent support for the digital transformation of the hotel industry.

Galaxy Entertainment has innovated the talent cultivation model and jointly established the "Greater Bay Area Elite Class" with Sun Yat-sen University, aiming to cultivate composite talents with multilingual abilities (fluent in Mandarin, Cantonese and English) to meet the diversified development needs of the hotel industry in the Greater Bay Area. The Venetian Macao Resort Hotel introduced a management team from Singapore. With the strong support of the government's entry policies, it optimized the energy consumption management system to an international top level in just six months. This "flexible intelligence introduction" model fully reflects the collaborative cooperation between the Macau government and enterprises in talent cultivation, demonstrating the determination and ability of both parties to jointly solve talent problems. The talent cultivation mode of government-enterprise cooperation not only provides a solid talent guarantee for the development of the hotel industry in Macau but also represents an important measure for hotel enterprises in Macau to actively integrate into the government's strategy and achieve sustainable development.

4.2 Market-Driven Innovation

Market-driven innovation, as a model for formulating innovative strategies based on market demand and market preferences, has its core objective of precisely aligning with market needs. In the current development landscape, the tourist groups faced by the hotel industry in Macau have become increasingly diverse. A product portfolio that solely focuses on high-end tourists is no longer able to meet the actual market demand. Therefore, customized product portfolios are gradually becoming the mainstream trend in the market (Wen et al., 2022).

In terms of practical implementation, many hotel enterprises in Macau have taken proactive actions. According to the characteristics and needs of different tourist groups, they have launched corresponding customized products. For example, the "Water World + Family Suite" package introduced by City of Dreams is an accurate response to the increasing number of family tourists. By integrating the hotel's featured entertainment facilities with family-themed accommodation services, this package provides family tourists with a one-stop high-quality travel experience, effectively meeting their travel needs.

The Londoner Macau, on the other hand, has meticulously designed the "48-Hour Express

Conference Solution" to address the specific needs of business travelers. This solution covers a series of services ranging from venue arrangement to refreshment supply, offering business travelers a convenient and efficient conference solution. Thanks to this innovative measure, The Londoner Macau has successfully enhanced the satisfaction of business travelers, with its business customer repurchase rate reaching as high as 67%. This fully demonstrates the remarkable effectiveness of customized products in meeting specific market demands.

The innovative practice of the Lisboa Hotel also deserves attention. The hotel has transformed its historical suites into "Metaverse Party Rooms" and ingeniously integrated virtual reality (VR) technology, allowing young tourists to immerse themselves in the unique experience of traveling back to the old streets of Macau in the 1960s while wearing VR glasses. This innovative product has attracted widespread attention on the Douyin platform, with the playback volume of related topics exceeding 300 million times. It has effectively attracted the young tourist group, nearly doubling the occupancy rate of post-95s customers and injecting new vitality into the hotel.

In addition, the introduction of a dynamic pricing system is also an important measure for the hotel industry in Macau to respond to market changes. This system can capture market dynamics in real time and flexibly adjust room prices according to various factors such as different time periods and market demand, so as to maximize revenue. Taking the period of the Macau Grand Prix in 2023 as an example, through the dynamic pricing strategy of adjusting room prices every 15 minutes, the Wynn Palace achieved a remarkable result of a 22% increase in revenue during the peak season compared to the fixed pricing model, while reducing the vacancy rate to below 4%. This case fully demonstrates the important role of the dynamic pricing system in enhancing the market competitiveness and economic benefits of hotels.

In conclusion, through market-driven innovative measures such as the introduction of customized product portfolios and dynamic pricing systems, the hotel industry in Macau has actively responded to market changes, effectively met the needs of different tourist groups, and enhanced its own market competitiveness and economic benefits. These practical experiences provide valuable references for the sustainable development of the hotel industry in Macau and also offer insights for the innovative development of the hotel industry in other regions.

4.3 Culture-Integrated Innovation

Cultural integration-driven innovation mainly refers to the innovative cooperation between the hotel industry in Macau and Macau's local cultural heritage resources or currently popular cultural IPs. The aim is to reconstruct the localized experience in Macau. Faced with Macau's long history and diverse culture, the hotel industry in Macau can choose to make flexible use of cultural heritage. For example, the Four Seasons Hotel, in collaboration with the Macau Museum, launched the "Maritime Silk Road Dinner". By pairing Portuguese dishes with blue and white porcelain tableware, it offers tourists a unique Macau experience.

In addition to this, through cross-border co-branding with various IPs, it provides more distinctive cultural experiences. For instance, MGM Cotai jointly created the "Old Neighbors' Tea Restaurant" in collaboration with the TV drama "The Grand Grandson of Gamblers". By replicating the mosaic floor tiles and old-fashioned booths in the drama, it has significantly increased the average passenger flow. The themed suite of "A Thousand Li of Rivers and Mountains" jointly launched by the Galaxy Hotel and the cultural and creative products of the Palace Museum has maintained an occupancy rate of over 95% for half a year. The Venetian introduced the FIFA eWorld Cup of the football game, causing the reservation volume of the game-themed rooms to soar by 210%. These examples fully demonstrate that the combination of diverse IPs can bring more profits to hotels.

4.4 Technology-Empowered Innovation

Technology-enabled innovation mainly refers to the introduction of existing technologies. It aims to enhance the service experience and provide pilot support for the subsequent introduction of emerging technologies, with the ultimate goal of constructing a fully-covered digital ecosystem. The high-standard requirements of the hotel industry in Macau have propelled the popularization of digital hotel services. For example, the "SMART" system (Smart Booking, Mobile Check-in, Auto-response, Real-time Tracking, Total Connection) constructed by Sands China is a reconstruction of the digitalization of the entire hotel service process.

Furthermore, artificial intelligence technology is also being applied in various hotels in Macau. The cameras in The Ritz-Carlton Hotel analyze guests' micro-expressions. Once a frown lasts for more than 3 seconds, it triggers service recovery. Solving such

detail-oriented services through technological means can greatly save staff training costs and fully integrate technology with services. In addition, services such as the dynamic pricing system, service quality detection, and supply chain traceability brought about by the application of technology can effectively improve the service quality of hotels. For example, The Venetian Macao Resort Hotel uses NLP technology to analyze 24,000 daily review data in real-time. The speed of identifying service quality problems has increased by 16 times compared to manual methods. In terms of tracing the origin of hotel-purchased goods, the introduction of blockchain technology can effectively reduce procurement disputes.

5 CONCLUSION

Analysis based on the PEST model indicates that the innovation of management strategies in the Macau hotel industry requires multi-dimensional synergy. Politically, it should actively embrace the dividends of national policies and explore cross-border integration models such as "exhibition and convention + hotel" and "cultural IP + vacation". Economically, it needs to establish a flexible pricing system and a member ecosystem to cope with the fluctuations in the tourism market. Socially, it should attach importance to the experiential needs of the new-generation consumers, and enhance brand stickiness through themed scene design and the implantation of local culture. Technologically, it must accelerate digital transformation and use technologies such as AI customer service and meta-universe virtual hotels to reconstruct service processes.

Meanwhile, the Macau government is uniting all parties to jointly boost the transformation of the local tourism industry, shifting from the single gambling-based industry to a more diversified cultural industry. The research reveals that through the collaborative innovation of policy response, market-driven forces, cultural integration, and technology-enabled capabilities, the Macau hotel industry is gradually breaking through its dependence on traditional development paths and forming a transformation and upgrading paradigm with regional characteristics. Policy-responsive innovation demonstrates the deep coupling between the institutional environment and organizational strategy. By constructing a collaborative mechanism of "Macau resources + Greater Bay Area space", enterprises can transform policy dividends into development momentum. Market-driven innovation reveals the value-

creation logic guided by demand, reshaping market boundaries through continuous product iteration and process reengineering. Cultural - integration - driven innovation constructs a transformation path from heritage activation to commercial value, providing new ideas for heritage protection and cultural innovation in high - density tourism cities and achieving the modern expression of cultural genes through the "invention of tradition". Technology - enabled innovation showcases the in - depth breakthroughs of digital transformation, accelerating the innovation of management strategies through the introduction of technologies.

However, this paper also has two limitations. First, it does not deeply explore the interaction mechanisms among different innovation strategies. Second, the case studies are mainly concentrated on leading enterprises. In the future, social network analysis can be used to reveal the role evolution of small and medium - sized hotels in the innovation ecosystem. Meanwhile, cross - regional comparative research should be strengthened to verify the universality of the theoretical model, providing more guiding theoretical support for the innovation and development of the hotel industry in Macau and other regions. The innovation journey of the Macau hotel industry is essentially a dialogue between tradition and modernity. Only by continuously breaking through cognitive boundaries can it anchor its value coordinates in the tide of change.

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