

The Application of AI in the Real Estate Industry: Business Model Innovation Perspective

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Abstract

This paper mainly discusses how Taiwan's real estate agency system uses artificial intelligence (AI) to reshape the traditional business model and create business model innovation. This study uses the Fuzzy Analytical Hierarchy Process (FAHP) and the literature analysis method to construct an analytical framework of four major dimensions based on nine key elements of the business model. Through empirical analysis of relative weights, important propositions are established. The research object is targeted at Tainan, Taiwan. A survey of real estate agency companies and marketing businesses was conducted to show that AI technology drives real estate agency business model innovation, and based on consumer business behavior, it accurately predicts market trends and improves marketing performance, thereby enhancing competitive advantages.

Keywords : Real estate industry, AI, Fuzzy Analytic Hierarchy Process (FAHP), Business Model Innovation

1. Introduction

In recent years, in response to the continuous development and evolution of AI (Artificial Intelligence) artificial intelligence technology, various industries are accepting the challenge of digital transformation, and of course the real estate agency industry (real estate agency) is no exception.

Through the application of AI technology, big data analysis can be used to quickly match customer needs with potential buyers, or virtual tour technology can be used to quickly improve user experience. These innovative ideas and methods have brought great benefits to the real estate industry.

This study focuses on the application of AI in the real estate industry and explores its impact on the industry from the perspective of business model innovation, with a view to providing inspiration and reference for the industry. The purpose of this study is:

- (1) Through various previous literature discussions, collect and sort out the key factors of business service innovation, and develop "main dimensions" and "secondary dimensions".
- (2) Integrate AI artificial intelligence technology through facet analysis and use the fuzzy analytic hierarchy process (FAHP) to carry out a survey in order to determine the relative weights of "main facets" and "secondary facets".
- (3) Based on the research conclusions, analyze the key factors of how AI application promotes business model innovation in the real estate agency industry as a driving force for industry transformation, and explore possible future innovation directions as an important reference for achieving sustainable development.

2. Literature Review

The term "business model innovation" was coined by Amit and Zott[1], consisting of the two terms "innovation" and "business model", indicating the need to develop innovative business models.

Innovation involves the introduction of new ideas, methods or techniques to create or improve upon existing products, services or processes. Therefore, business model innovation is about rethinking this structure and finding new ways to create value for the company. This is not just a fine-tuning of existing business processes, but a fundamental shift in the company's core value proposition, revenue sources and cost structure to adapt to market changes and gain competitive advantage[2].

Business model innovation enables companies to swiftly respond to market changes and gain a deeper understanding of consumer needs. Enterprises can innovate across dimensions such as customer value, value chain, value network, and expanded business models, ultimately offering improved services to customers through effective innovation, thereby strengthening the enterprise's market competitive advantage and providing a basis for the sustainable development of the enterprise. Certain guarantee[3].

Innovation in real estate business models arises not only within real estate companies but also through the interactions between real estate companies, building users, and other participants within the network. Real estate business model innovation should not be viewed as the result of actions taken solely by real estate companies or building users, but rather as the outcome of interactions among two or more stakeholders within a network[4] , [5] , [6].

Real estate companies need to adapt their mindset and actions early in the development process to create

value-driven business models. The transition from providing products to enabling value-creating processes represents a shift in focus from the real estate company to the building user, highlighting the resources that support the processes the building user seeks to leverage. [7]

AI artificial intelligence can affect market development. By employing various artificial intelligence techniques, such as customer analysis, industry insights, and cross-functional integration, companies can gain a comprehensive understanding of consumer needs and apply these insights to enhance their marketing strategies.[8]. Digitalization has also become a key element in the business development function of real enterprises, and the issue of digitalization has also shown the improvement of innovation capabilities at the enterprise level [9].

This study collates domestic and foreign experts and scholars' literature on business model innovation and the application of AI artificial intelligence to real estate, and compiles and constructs the main dimensions of business model innovation, namely "value innovation", "value chain innovation", and "value network". The four major dimensions of "innovation" and "broadening business models" are described as follows:

At the level of "customer value innovation", in order to stand out in the fierce homogeneous market competition, we must pay close attention to changes in consumer needs, deeply explore their potential needs, and carry out innovative interpretations and redefinitions; only through this Only through accurate insight into demand and innovation can enterprises gain an advantageous position in the competition. At the same time, companies must redefine and segment their customer base, and explore new value propositions based on shifts in customer needs. This enables them to better and more quickly respond to changes in consumer demands. Throughout this process, companies should conduct thorough research and analysis of market consumer needs, while establishing an effective communication mechanism between the company and its customers to ensure that the business model undergoes fundamental innovation [3].

At the level of "value chain innovation," the core idea is to optimize internal resource allocation within the company based on consumer needs, ensuring resources are fully utilized and cost advantages are maximized. The fundamental concept involves identifying the key elements centered around consumer needs, strategically combining and adjusting the critical components, and aligning the less important parts to support the central elements. This approach strengthens the leading role of the crucial links while enabling the secondary links to play a more supportive role, ultimately achieving a more effective resource allocation within the value chain[3].

At the level of "value network innovation," the essence lies in focusing on customer value, which allows for the effective optimization of both internal and external resource allocation within the company. This approach drives continuous innovation across the entire industry chain, enabling the company to achieve dynamic market development. Companies can strategically reconstruct the

supply chain structure to optimize resources, enhance collaborative relationships, and ensure the supply chain can adapt flexibly to market changes. This type of innovation involves simplifying supply chain processes based on consumer needs, thereby improving the relationship between the company and its supply chain partners [3].

At the level of "broaden business models," it is evident that, in a sustainable market economy, business competition is intensifying. As a result, companies must consistently innovate their business models throughout their operations. In the course of development, companies need to regularly assess and evaluate their own situations, identifying their strengths in business development and competitive dimensions. Simultaneously, it is crucial to gain a comprehensive understanding of the customer base distribution and clearly define the company's business development positioning[3].

Regarding real estate marketing methods, with the increasing development of information technology, it is a basic skill for real estate agents to use technology and digital marketing methods, and more real estate agents are beginning to use AI technology to actively promote sales activities. Facing the wide range of demands in the real estate market, it can strengthen organizational operations and improve corporate performance.

3. The construction of AI in the real estate agency business model innovation perspective

3.1 Research Framework

This study combines the discussion results of the Focus Group to construct a definite hierarchical structure of AI business model innovation in the real estate industry, consisting of four primary dimensions and twelve evaluation criteria, as shown in (Fig.1).

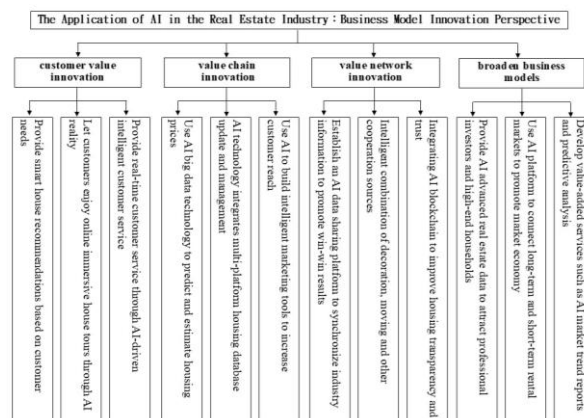


Fig. 1 Research Framework

3.2 Research Subjects

This study takes the real estate industry players and scholars in Tainan, Taiwan as the research object, and aims at researching the real estate industry players' perspectives on the use of AI technology and business model innovation. Using purposive sampling, 12 scholars and industry experts with professional expertise in AI, the real estate industry, and other relevant fields were selected as participants for the FAHP questionnaire. In

addition, before conducting the survey in this study, the researcher will first explain the purpose of this study to the questionnaire respondents, and conduct the FAHP questionnaire survey to the real estate industry personnel who are willing to assist in the questionnaire survey.

4. Research Result

This study further multiplies the four evaluation indicators with their respective dimensions, and the resulting value is the comprehensive weight. Table 1 shows the comprehensive weight of AI business model innovation.

Table 1 Comprehensive weight of AI business model innovation

Dimension	Weights	Evaluation indicators	Weights	Comprehensive weight
customer value innovation	0.276	Provide smart house recommendations based on customer needs	0.486	0.134
		Let customers enjoy online immersive house tours through AI reality	0.212	0.059
		Provide real-time customer service through AI-driven intelligent customer service	0.302	0.083
value chain innovation	0.368	Use AI big data technology to predict and estimate housing prices	0.437	0.161
		AI technology integrates multi-platform housing database update and management	0.269	0.099
		Use AI to build intelligent marketing tools to increase customer reach	0.294	0.108
value network innovation	0.195	Establish an AI data sharing platform to synchronize industry information to promote win-win results	0.146	0.028
		Intelligent combination of decoration, moving and other cooperation sources	0.336	0.066
		Integrating AI blockchain to improve housing transparency and trust	0.518	0.101
Broaden business models	0.161	Provide AI advanced real estate data to attract professional investors and high-end households	0.345	0.056
		Use AI platform to connect long-term and short-term rental markets to promote market economy	0.162	0.026
		Develop value-added services such as AI market trend reports and predictive analysis	0.493	0.079

There are 12 real estate industry experts believe that the top five most important evaluation indicators are "Use AI big data technology to predict and estimate housing price " (the comprehensive weight is 0.161), and the second-ranked one is "Provide smart house Recommendations based on customer needs " (the comprehensive weight is 0.134), the third ranking is "Use AI to build intelligent marketing tools to increase customer reach" (the comprehensive weight is 0.108), the fourth ranking is "Integrating AI blockchain to improve housing transparency and trust" (the comprehensive weight is 0.101), and the fifth ranking is "AI technology integrated multi-platform housing database update and management" (the comprehensive weight is 0.099).

Furthermore, the evaluation indicators placed between sixth and twelfth are: "Providing real-time customer service through AI-driven intelligent customer service" (the comprehensive weight is 0.083), "Developing value-added services such us AI market trend reports and predictive analysis" (comprehensive The weight is 0.079), "Intelligent combination of decoration , moving and other cooperation sources" (the comprehensive weight is 0.066), "Let customers enjoy online immersive house tours through AI reality" (the comprehensive weight is 0.059), "Providing AI advanced Real estate data to attracts professional investors and high-end households" (the comprehensive weight is 0.056), "Establishes an AI data sharing platform to synchronize industry information to promote win-win results" (the comprehensive weight is 0.028), and "Uses AI platforms to connect the long-term

and short-term rental markets to promote market economy" (The comprehensive weight is 0.026).

5. Conclusion and recommendations

This study summarizes important findings on business model innovation and summarizes the following four conclusions:

5.1 The key evaluation indicator of customer value innovation is "Providing smart house recommendations based on customer needs"

The key to customer value innovation lies in understanding and meeting customer needs, and "providing smart housing recommendations based on customer needs" has become an important evaluation indicator, reflecting the value of a customer-centric strategy. Smart house recommendation relies on data analysis and artificial intelligence technology to accurately identify customers' house purchase preferences and improve service efficiency and accuracy. This personalized recommendation method improves customer satisfaction and loyalty through in-depth exploration of needs. In addition, smart recommendations also demonstrate the ability of technology to be used in business innovation, becoming an important means of differentiated competition for real estate companies and one of the core standards for measuring customer value innovation.

5.2 The key evaluation indicator of value chain innovation is "Use AI big data technology to predict and estimate housing prices."

Value chain innovation mainly improves corporate operational efficiency and value creation, and "using AI big data technology for housing price prediction and estimation" as an important evaluation indicator highlights the profound impact of technology on value chain optimization. AI and big data can quickly process massive amounts of information and provide accurate housing price predictions, helping decision makers quickly respond to market changes. House price estimation improves transaction transparency and efficiency, helps reduce the risk of information asymmetry, and increases customer trust. At the same time, the application of this technology can reduce valuation labor costs and optimize resource allocation. The use of AI big data technology not only strengthens the core competitiveness of the value chain, but also drives the real estate industry towards an intelligent and data-driven future.

5.3 The key evaluation indicator of value network innovation is "Integrating AI blockchain to improve housing transparency and trust"

Value network innovation emphasizes the creation of shared value in multi-party cooperation, and "integrating AI blockchain to improve housing transparency and trust" as an evaluation indicator demonstrates the

transformative effect of technology integration on the value network. AI technology can quickly analyze market data, while blockchain ensures that transaction data is transparent and cannot be tampered with. The combination of the two effectively reduces the risk of information asymmetry. Specifically, AI helps with risk assessment and market analysis, providing a basis for multi-party decision-making. In addition, it not only improves the efficiency and security of real estate transactions, but also promotes collaboration among members of the value network to achieve benefit sharing and trust growth, becoming the driving force for sustainable development.

5.4 The key evaluation indicator of broaden business models is "Develop value-added services such as AI market trend reports and predictive analysis"

The core of broadening the business model is to create new value and new revenue sources, and "developing AI market trend reports, predictive analysis and other value-added services" as an evaluation indicator reflects the innovation needs in the data-driven era. AI market trend reports and predictive analysis can provide accurate market insights, help enterprises and customers grasp industry trends and risks in advance, and help improve the quality of decision-making. This type of value-added services expands the boundaries of traditional business models, not only increases revenue sources, but also enhances brand value and competitiveness. In addition, when a company can strengthen its connection with customers, it can increase customer stickiness and loyalty, laying the foundation for the company to achieve long-term sustainable development.

5.5 Recommendations

Future research suggests that we can focus on AI smart recommendations and adaptability to customer needs, the transparency of AI housing price forecasts and response to market dynamics, the integration of AI and blockchain technology, and the expansion of value-added services, etc., and analyze market trends and business through AI. The value report, as well as the potential for cross-industry technology integration and cooperation, combined with empirical cases to verify the actual effect of innovation indicators, will help promote the theoretical promotion and practical progress of business models.

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Authors Introduction

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