Proceedings of ICFTBA 2025 Symposium: Financial Framework's Role in Economics and Management of Human-Centered Development
DOI: 10.54254/2754-1169/2025.GL26318

Application of Artificial Intelligence in the Property Management Industry: A Case Study of Poly Property

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Abstract. Artificial intelligence has been extensively deployed in the property-management sector, yielding significant improvements in service efficiency and reductions in operating expenditure. This paper examines the development of AI in the property management industry through a case study of Poly Property Services Co., Ltd., employing a multi-dimensional analytical approach to systematically and in-depth analyze the current application status, development trends, and potential challenges of AI in property management. It is found that there are problems such as insufficient depth of technology application and difficulties in data integration during the practice of intelligent management. In response to these problems, this paper puts forward targeted and operable countermeasure suggestions from the levels of technological innovation, talent cultivation, data governance, etc., including the construction of a collaborative platform for intelligent management and the improvement of the data security system. The research results of this paper not only furnishes a theoretical foundation and actionable guidance for the intelligent transformation of the property management industry, but also and fosters cross-sector collaboration the deep integration of artificial intelligence and the property management industry and strengthen the cooperation between industry, academia and research, which is of great practical significance for promoting the high-quality development of the property management industry.

Keywords: artificial intelligence, property management, Poly Property

1. Introduction

Rapid advances in science and technology are fundamentally transforming multiple industries, and even reshaping the way of operation of the times, in which artificial intelligence, as an emerging technology, has had a far-reaching impact on various fields, from smart home and unmanned driving to intelligent translation and intelligent factories, artificial intelligence is being widely used in various fields [1]. Artificial Intelligence is an intersection of computer science, mathematics, statistics, and other disciplines, and is a cross-cutting technology that simulates human intelligence [2].

In today's rapid development of science and technology, artificial intelligence is gradually penetrating into all walks of life, which has a profound impact on the operation and development of

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enterprises. The traditional property management model faces issues including high labor costs, low service efficiency, and inadequate management precision, rendering it difficult to meet the increasingly diverse and sophisticated demands of property owners [3]. With the emergence of artificial intelligence technology, the property management industry faces a new opportunity to break the bottleneck of the development of the real estate industry [4]. Through the use of machine learning, natural language processing, computer vision, and other artificial intelligence technologies, real estate companies can achieve intelligent management and refined services, improve operational efficiency and service quality, so as to gain an advantage in the fierce market competition. Digital transformation introduces more intelligent technologies and systems, which require companies to cultivate more talents with digital skills to meet the challenges of the digital work environment [5].

As a head enterprise in the property management industry, Poly Property, by virtue of its mature operation system and professional service capability, has outstanding performance in the management of diversified industries such as residential, commercial complexes, and industrial parks.

2. Introduction to the case of Poly Property Services Ltd

2.1. Basic information about Poly Property Services Ltd

First, founded in 1996, Poly Property Services Co., Ltd. is a leading property management service enterprise in China with a state-owned enterprise pedigree, providing property management, non-owner value-added services, and community value-added services. Since 2005, the Company has initiated a nationalized layout and built a comprehensive service system covering the property management value chain.

Second, the organizational structure. As can be seen in Figure 1, Poly Property employs a vertical management structure, where the decision-making level (board of directors) oversees the AI strategy, and the executive level (Information Technology Department and Operation Management Department) is responsible for its implementation. This structure provides strategic support for AI applications; however, inter-departmental coordination frictions persist, as exemplified by conflicting data access protocols.

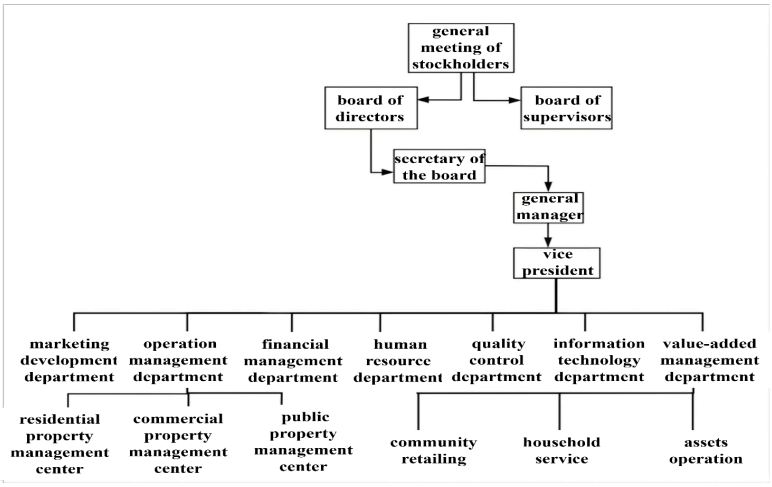

Figure 1. Company organization structure

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Third, business revenue. As can be seen in Figure 2, there is a close linkage between Poly Property's diversified revenue structure and the application of AI technology, and the deep integration of AI is reshaping the revenue growth model and profitability of each business segment.

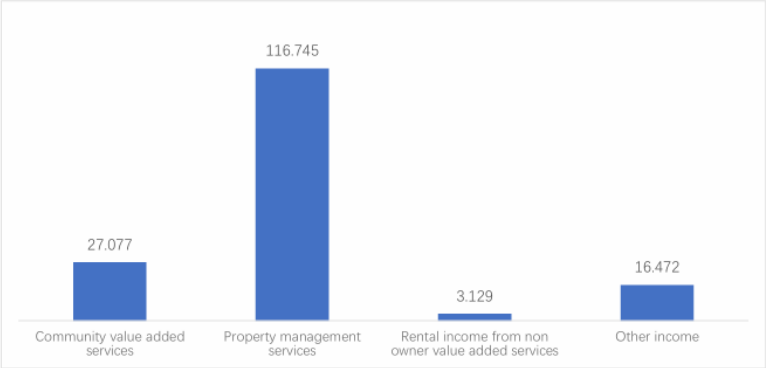

Figure 2. Poly Property operating income composition

Among the composition of Poly Property's operating revenue, property management service revenue amounted to RMB11.675 billion, accounting for the dominant share of total revenue, which is the Company's core source of revenue and contributes the most to the overall revenue. Community value-added services, at 27.08%, were an important component of operating revenue, showing certain business expansion results. Other income of 16.47% also played a complementary role, while the rental income from non-owner value-added services was the least, only 3.13%, contributing weakly to revenue. This structure shows the company's high dependence on property management services, and attention needs to be paid to the stability of this business to maintain the revenue base.

2.2. Poly Property artificial intelligence applications

First, AI applications in the field of intelligent security. Poly Property has actively introduced AI in the field of intelligent security and achieved good results. Poly Property has successfully applied for a patent for "a camera bracket assembly and camera", which utilizes servo motor drive and bi-directional screws to overcome the trouble of manual adjustment of traditional cameras, and is able to accurately carry out up and down movements, thus improving the convenience of using the security device. The functions of the smart camera continue to expand to include face recognition and behavioral analysis [6].

Second, Poly Property has utilized AI technology to achieve effective control in energy management. The Company's IEIM energy management platform has achieved private deployment and lightweight adaptation of its self-developed DeepSeek model, thus signaling the transition of energy management to an AI-augmented paradigm. The platform focuses on the entire life cycle of an enterprise and is able to visually manage various major energy consumers. The company monitors energy consumption in real time by adopting technologies such as IoT and big data [7].

Third, AI applications in customer service. As can be seen in Figure 3, in terms of customer service, Poly Property improves service quality and efficiency with the help of artificial intelligence. Leveraging artificial intelligence technology, the Customer Response Center has achieved full automation of post-ticket customer callbacks. This not only accurately captures real customer feedback and significantly improves customer participation rates but also effectively reduces the workload of frontline staff. The Board of Directors and the Committee determine the annual budget

DOI: 10.54254/2754-1169/2025.GL26318

targets, set profit margin targets for different businesses, and approve budget targets, adjustment plans, and assessment results [8]. The management's finance department integrates into each business line through FBP, sets budget rules, balances the budget, and monitors the execution. Executive departments such as regional branches and project service centers are responsible for budget implementation.

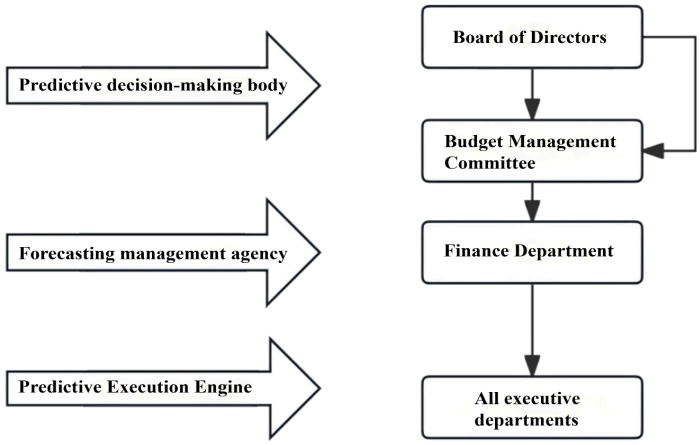

Figure 3. Company's overall budget structure

Source: Poly Property Company Annual Report.

3. Impact of artificial intelligence applications on Poly Property

3.1. Operational efficiency

First, in the field of intelligent security. As can be seen in Table 1, Poly Property has realized a significant improvement in security response efficiency by deploying AI cameras and electronic fence systems. Data indicate that the average security response time decreased significantly from 12.5 minutes in 2019 to 4.2 minutes in 2024. 2021 saw a brief rebound in security response time due to system upgrades. Second, in terms of energy management, relying on the IEIM platform and DeepSeek algorithm, the energy consumption per unit of floor area is reduced from 8.6kW·h/m^2 in 2019 to 5.1kW·h/m^2 in 2024. However, the reduction in energy consumption narrowed to 3.2% in 2023 due to extreme weather, underscoring the decreased robustness of the predictive model under such conditions.

In summary, these practical experiences and challenges not only provide a direction of improvement for Poly Property's own intelligent transformation, but also provide valuable reference cases for the application of artificial intelligence in the property management industry, warning the industry of the need to fully consider the complexity of the technology landing in the process of advancing the intellectualization and scene suitability.

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Table 1. Operating efficiency of enterprises

Year	Security response time (minutes)	Unit energy consumption (kWh/m^2)	Rate of efficiency gains in budgeting
2019	12.5	8.6	-
2020	9.2	7.8	35%
2021	8.3	7.2	42%
2022	5.8	6.5	50%
2023	4.8	6.3	55%
2024	4.2	5.1	60%

Source: Poly Property Company Annual Report.

3.2. Service quality and customer experience

First, in customer service scenarios. As can be seen in Table 2, the introduction of artificial intelligence has dramatically improved service response efficiency. Intelligent customer service butler realizes 24/7 online service, compressing the mean resolution time of owners' inquiries from 28 minutes in 2019 to 11 minutes in 2024. However, there was a 15% fluctuation in the consultation-to-labor rate in 2022 due to untimely updating of the knowledge base, highlighting the importance of knowledge maintenance of the intelligent customer service system. Second, in the report work order management segment, the intelligent return visit coverage rate of report work orders significantly increased from 35% in 2019 to 92% in 2024, and the customer participation rate increased from 18% to 67%, but complaints were triggered by algorithmic misjudgment in 2023.

Overall, the deepening of intelligent customer service not only requires continuous optimization of the technical model and data support, but also needs to pay more attention to the differentiated needs of business scenarios, and promote the in-depth integration of AI and property management services by dynamically adjusting the service strategy and technological iteration, so as to realize the sustainable improvement of service quality.

Table 2. Service quality and customer experience of companies

Year	Consultation resolution time (minutes)	Work order callback coverage	Customer participation rate	Personalized service satisfaction rate
2019	28	35%	18%	-
2020	22	58%	32%	55%
2021	18	75%	45%	60%
2022	15	85%	58%	65%
2023	13	90%	62%	68%
2024	11	92%	67%	71%

Source: Poly Property Company Annual Report.

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3.3. Technical system stability and compatibility

First of all, in the field of intelligent security. The false alarm problem of the AI system of Poly Property is showing an intensifying trend. Table 3 shows that the system's false alarm rate fluctuates from 5% in 2019 to 8.7% in 2024, in which the perimeter alarm system has three missed alarms one after another in 2023 due to the failure of the camera firmware upgrade, and the increase in the false alarm rate reflects the lack of hardware and software synergy. Second, the problem of algorithmic adaptability of the energy management platform is more prominent. Between 2022 and 2024, the energy consumption prediction error rate for business park projects remained between 12% and 15%, significantly higher than the 8% average for residential projects. This indicates that the existing AI framework struggles to accommodate the heterogeneous operational requirements of complex business models.

In summary, when promoting the scale of AI technology, it is necessary to strengthen the flexible design of the system architecture, strengthen the scene adaptation capability of the algorithm, and establish a dynamic adjustment mechanism for the synergistic evolution of technology and business to ensure that AI technology truly empowers the high-quality development of the property management industry.

Table 3. Enterprise technology systems

Year	Security False Alarm Rate	Business Park Energy Consumption Forecast Error Rate	Number of system failures
2019	5.0%	10.2%	2
2020	5.8%	11.5%	3
2021	6.3%	12.1%	1
2022	7.5%	13.2%	4
2023	8.2%	14.8%	5
2024	8.7%	15.0%	3

Source: Poly Property Company Annual Report.

3.4. Data governance and organizational suitability

Firstly, at the level of data security management, Poly Property revealed critical security gaps. As can be seen in Table 4, between 2019 and 2024, there were 4 incidents of owners' information leakage due to flaws in data rights management. Among them, one data leakage incident in 2023 affected 1,200 households, highlighting the weakness of rights management. Second, from the perspective of organizational adaptability, the in-depth application of AI technology has had a strong impact on the traditional job structure. between 2021 - 2023, the Information Technology Department and the Operations Management Department had 17 process conflicts over data attribution, which culminated in mandatory delays of the AI application deployment of three key projects, reflecting the insufficient adaptability of the organizational structure and division of authority and responsibility in the midst of technological change.

Overall, to promote intelligent transformation, it is not only necessary to pay attention to the upgrading and iteration of the technology itself, but also to simultaneously improve the data security governance system, optimize the organizational synergy mechanism, and strengthen the talent training and capacity building, so as to realize the in-depth fusion of technology and management

DOI: 10.54254/2754-1169/2025.GL26318

through multi-dimensional systematic reforms to ensure the steady advancement of the intelligent strategy.

Table 4. Enterprise data governance and organizational suitability

Year	Data security incidents (cases)	Departmental process conflicts (times)	AI equipment operation compliance rate
2019	1	3	25%
2020	0	5	32%
2021	1	4	38%
2022	1	6	40%
2023	2	7	41%
2024	1	2	43%

Source: Poly Property Company Annual Report.

4. Existing problems

First, the technology system's adaptability and stability are insufficient. As the scale of the enterprise expands, there is an obvious shortage of AI in terms of adaptability. In terms of intelligent security, the misjudgment rate of Poly Property's AI monitoring system increased from 5% in 2019 to 8.7% in 2024. Among these cases, three missed alarms stemmed from mismatches between camera firmware and algorithms, directly impairing the security protection effectiveness of the premises and preventing potential security risks from being timely alerted and addressed, and the continuously rising misjudgment rate not only increased the ineffective response frequency of the security personnel but also caused a waste of manpower, and may also reduce the trust of security personnel in the intelligent system, resulting in traditional security such as manual inspection. Waste of manpower, but also may reduce the security personnel on the intelligent system of trust, resulting in manual inspection and other traditional security means being difficult to effectively complement the formation of intelligent systems.

Second, the data governance system and security mechanism lag behind. With the development of AI technology, enterprises are facing serious challenges in data governance. During 2019-2024, Poly Real Estate had four incidents of owners' information leakage due to loopholes in the management of data authorization, including malicious tampering of the customer service system of the first phase of the project in 2023, which resulted in the privacy of more than 1,200 owners being affected, and the data security protection system had weak links. Meanwhile, 3.2% of abnormal data collected by sensors in the energy management platform was not handled in a timely manner, resulting in three air-conditioning systems being misdispatched in the third quarter of 2022, resulting in a waste of over 12,000 kWh of energy. The ramifications of these data-governance and security lapses are non-trivial. Frequent leakage of owners' information seriously infringes on owners' privacy rights, and is very likely to trigger a crisis of trust between owners and the enterprise, leading to a significant drop in customer satisfaction, and even triggering collective complaints or lawsuits, exposing the enterprise to the risk of huge compensation and administrative penalties, and at the same time damaging the enterprise's long-accumulated brand image and reputation in the marketplace.

Third, a pronounced misalignment between organizational readiness and workforce capabilities persists. The introduction of artificial intelligence has brought a systematic impact on the organizational system of enterprises. The adjustment of positions brought about by the application of

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technology makes the problem of personnel adaptation particularly prominent: the skills assessment of 300 frontline employees in 2024 shows that only 43% can proficiently operate AI terminals, while 28% of managers still rely on traditional experience for decision-making. This resulted in a 15% rate of escalation to manual processing in the early stages of consultation implementation, and departmental synergy mechanisms lagging behind the technological requirements; in the process of promoting the AI project, the In the course of the AI project, the deployment of the energy consumption monitoring system in the business park in 2022 was delayed by two months due to unclear division of data collection authority between the Operations Management Department and the IT Department. The negative impacts of these issues were extensive and far-reaching. The lack of AI operation skills of front-line employees directly reduces the response efficiency and service quality of intelligent services, leading to a decline in customer experience, which in turn affects customer satisfaction and loyalty; the managers' adherence to the traditional decision-making mode prevents the data analysis and prediction advantages of AI from being given full play, hindering the enterprise from responding quickly to changes in the market and optimizing its management strategies.

5. Recommendations for countermeasures

First, improve the adaptability and stability of the technology system. For the problem of insufficient adaptability and stability of the technical system, a comprehensive optimization roadmap is imperative. In the field of intelligent security, it is recommended to establish a camera firmware management mechanism of "biweekly inspections + quarterly upgrades" to effectively reduce the risk of false alarms and missed detections caused by version incompatibilities [9]. At the same time, the introduction of edge computing technology for front-end camera arithmetic upgrades enables real-time on-device anomaly detection of abnormal behavior and early warning, and reduces the impact of network delays on response efficiency; it is recommended that enterprises establish interdisciplinary expert teams for complex business scenarios such as commercial parks and industrial complexes. These teams should integrate building energy consumption historical data, meteorological prediction models, and real-time equipment operating parameters to develop dynamic and adaptive energy management algorithms, to develop dynamic and adaptive energy management algorithms. It is recommended to build a dynamic algorithm model to optimize scene adaptation.

Secondly, data governance and security protection should be strengthened. In order to solve the problem of a lagging data governance system and security mechanism, it is necessary to build an all-around, multi-level data governance framework. First, establish a data management system covering the whole business process, enact a "Data-Lifecycle Governance Standard", clarify the specific responsibilities and authorities of the Operation Management Department, Information Technology Department, Customer Service Department and other departments in data collection, storage, use and sharing, and eliminate the ambiguity of data attribution between departments by drawing a data authority and responsibility matrix [10]. In the era of industrialization, enterprises with high technology have lower relative inputs of labor and machinery and equipment and higher production efficiency [11]. Enterprises use big data, cloud computing, and other digital technologies to reduce the cost of information transfer between organizations within the enterprise, improve the efficiency of information transfer, and optimize organizational management processes and decision-making results [12].

Thirdly, optimizing organizational suitability and talent structure. In view of the prominent contradiction between organizational suitability and talent structure, it is necessary to systematically

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promote the reconstruction of the talent training system and the innovation of the organizational synergy mechanism. In terms of talent capacity building, the construction of a "three-stage, three-dimensional" AI skills training system: the basic level of AI terminal operation, data visualization and other general courses, through the combination of online learning platforms and offline hands-on workshops, to guarantee frontline personnel's operational proficiency with AI-enabled devices; the strategic level of the management level to open the AI strategic planning, digital transformation management and other training courses, At the strategic level, the company provides management with workshops on AI strategic planning and digital transformation management to promote the innovation of management thinking. In terms of organizational synergy optimization, a cross-departmental AI project joint working group was set up, led directly by the top management of the enterprise. By drawing a responsibility matrix for the whole process of the AI project, it clarifies the responsibilities of the Operations Management Department for data collection and business demand sorting, the IT Department for system development and technical support, and the Customer Service Department for application feedback and optimization suggestions, thus forming a synergistic mechanism with clear rights and responsibilities.

6. Conclusion

This study analyzes the application of artificial intelligence in the property management industry using Poly Property Services Co. as a case study. The study finds that the introduction of AI technology has significantly improved the enterprise's operational efficiency, as evidenced by the drastic reduction in security response time and energy consumption, and improvements in budgeting efficiency, among other indicators. It has also improved the service quality and customer experience, such as the shortening of the time for owners to solve their inquiries, and the increase in the coverage rate of work order return visits and the rate of customer participation. However, in the process of technology application, problems such as insufficient adaptability and stability of the technology system, lagging data governance system and security mechanism, as well as prominent contradiction between organizational adaptability and talent structure, have also been exposed. Based on this, this paper puts forward countermeasure suggestions such as strengthening the optimization of technical systems, building data governance and security systems, and optimizing organizational suitability and talent structure. This study offers actionable insights for the application of AI technology in the property management industry, and in the future, relevant enterprises can further deepen the application of technology and improve the management mechanism to give full play to the advantages of AI and promote the high-quality development of the industry.

References

[1] Wu, W., Zhang, Y. (2025) Artificial Intelligence Innovation and Environmental Performance: Unraveling the Complex Roles of Application and Method Innovation Across Enterprise Sizes. Technological Forecasting & Social Change, 218, 124211.
[2] Dong, L. T. (2025) Research on the Application of Artificial Intelligence Technology in Enterprise Human Resource Management. China Management Informatization, 10, 145-147.
[3] Tang, M. X. (2025) Application of Big Data and Artificial Intelligence in Enterprise Financial Management. Tax, 10, 70-72.
[4] Ding, M. Y. (2024) Application of Artificial Intelligence in Enterprise Innovation. China Science and Technology Investment, 19, 22-24.
[5] Manuel, J., Ianacio, D., Mariano, S. (2023) The Impact of Digital Transformation on Talent Management. Technological Forecasting & Social Change, 1, 1-10.

DOI: 10.54254/2754-1169/2025.GL26318

[6] Liu, Q. (2024) On the Application of Artificial Intelligence in Enterprise Financial Analysis. Caixun, 9, 165-167.
[7] Li, X. D. (2021) Application of Artificial Intelligence in Enterprise Financial Risk Prevention and Control -- Based on Big Data Environment. Accounting Communication, 22, 137-142.
[8] Mo, B. Q. (2020) Application and Prospect of Artificial Intelligence in Enterprise Financial Management. Financial Circles, 20, 146-147.
[9] Subramani, S. (2019) Transforming the Enterprise with Applied Artificial Intelligence. Applied Marketing Analytics, 1, 65-68.
[10] Feng, B. (2019) Application of Artificial Intelligence Technology in Enterprise Informatization. Electronic Technology and Software Engineering, 2, 252.
[11] Midrigan, V., Xu, D. Y. (2014) Finance and Misallocation: Evidence from Plant-Level Data. American Economic Review, 2, 422-458.
[12] Mikalef, P., Pappas, I. O., Krogstie, J., et al. (2018) Big Data Analytics Capabilities: A Systematic Literature Review and Research Agenda. Information Systems and e-Business Management, 2, 1-32.