

Adoption of Artificial Intelligence and Technology in Customer Relationship Management for Property Management: A Systematic Literature Review

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DOI: <https://dx.doi.org/10.47772/IJRISS.2025.9010265>

Received: 14 January 2025; Accepted: 18 January 2025; Published: 17 February 2025

ABSTRACT

This systematic literature review paper investigates the integration of Artificial Intelligence (AI) and technology in Customer Relationship Management (CRM) within the property management sector. It delves into how these technologies are revolutionizing CRM practices, enhancing customer satisfaction, and optimizing operational efficiencies. This paper reviews the scholarly articles, industry reports, and case studies, the paper identifies significant benefits, challenges, and opportunities in the adoption of AI and technology. The findings reveal that AI-driven tools, such as chatbots, predictive analytics, and personalized marketing, significantly improve customer interactions and decision-making processes. Additionally, technologies like the Internet of Things (IoT) and blockchain are instrumental in streamlining property management operations, resulting in substantial cost reductions and enhanced service delivery. The review highlights that while AI and advanced technologies offer considerable benefits for CRM in property management, their successful implementation requires strategic planning, investment in training, and robust data governance frameworks. Moreover, the study emphasizes the importance of a customer-centric approach to leveraging these technologies, ensuring that the technological advancements align with the overall goals of enhancing customer relationships and satisfaction. The paper concludes by the recommendations for property management firms aiming to integrate AI and technology into their CRM systems, considering the need for ongoing evaluation and adaptation to stay on par of technological advancements and evolving customer expectations.

Keywords: Artificial Intelligence (AI), Technology Adoption, Customer Relationship Management (CRM), Property Management, Built Environment, Real Estate

INTRODUCTION

The fundamental existence of Customer Relationship Management (CRM) started in the 1980s when businesses began to recognise the importance of maintaining relationships with their clients. CRM is viewed as relevant to fostering loyalty of customers and increasing the revenue of the company (Soliman, 2011). The effort of CRM was focused on collecting and processing the customers data. Baashar, Y et al (2020) mentioned

that customer relationship management (CRM) involve an innovative technology that seeks to improve customer satisfaction, loyalty, and profitability by acquiring, developing, and maintaining effective customer relationships and interactions with stakeholders.

Ledro et al. (2022) stressed upon the fact that CRM has experienced a revolutionary upgrade since the inclusion of artificial intelligence and the technology it powers. It was further critiqued that businesses have been utilising CRM for the reasons that allows the company to establish and foster prolonged relationships with customers.

Furthermore, CRM enables businesses to offer personalized services to customers, conduct marketing activities based on targeted customers personalized choices and preferences and delivering significant value. The integration of technology with CRM has gained interest and become significant for further enhancing the method for the CRM process (Soliman, 2011). Therefore, this paper seeks to address the integration of Artificial Intelligence (AI) and technology in Customer Relationship Management (CRM) for property management.

The main aim of this paper is to investigate and explain through careful exploration about the integration of Artificial Intelligence (AI) and technology in Customer Relationship Management (CRM) for property management. This study aims to find out whether the integration of AI and technology in CRM has significant impact on the property management business or not. This paper will conduct a systematic literature review to prove and validate if organisations in property management face any challenge and share any new trend to ensure greater benefits from AI application in CRM.

AI in Customer Relationship Management

It had been noticed nowadays that Customer Relationship Management (CRM) had been extensively facilitated by artificial intelligence. AI has enabled businesses to use CRM by offering the commendable tools like AI-powered chatbots, big data analytics technology, predictive analysis, informed decision making, and personalized marketing and so much more. As stated by Fernando et al. (2023) the contemporary trends in CRM have shown that the use of AI is mandatory in order to progress successfully and building the everlasting relationships with existing and potential customers. Some of the modern-day trends are social CRM integration, which means that the organisations recognise the patterns of customers' availability and extensive presence on social media platforms known as the social media footprint. With the data of the social media footprint organisation can build the impactful relationships with targeted customers (Ozay et al., 2024). However, on the contrary, some challenges have also been encountered by the businesses while integrating AI in CRM. One of such challenges is cost overruns (Prabha and Subramanian, 2017); which happens because equipping CRM software with AI-enabled tools and technology require considerable investments along with training and maintenance costs in a long run.

Labib (2024) critiqued that the involvement of artificial intelligence in CRM marked a revolution which transformed the way of customer interactions were practice by conventionally. Businesses have now become more capable of marketing each of their clients separately; by targeting and marketing them personally. This efficiency has become possible because AI allowed company to understand the needs and demands as well as customers' expectations in an in-depth manner and devise customer engagement and customer relations strategy accordingly.

In another instance, Alsawa and Alshurideh (2022) argued that artificial intelligence is a concept which is quite broad and involves several different tools and aspects. One of these tools is machine learning; whose integration has been observed by businesses in carrying out real estate marketing operations. The study debated that in the case of real estate business each customer demand to be dealt with individually because each one of them have their own specific needs and preferences. While traditional marketing hinders and restricts the businesses to offer great deal of personalization, the use of artificial intelligence ensures that personalized marketing is done so that each customer's needs can be targeted. In this quest, AI-enabled machine learning plays a pivotal part in helping real estate businesses to address their customers' concerns.

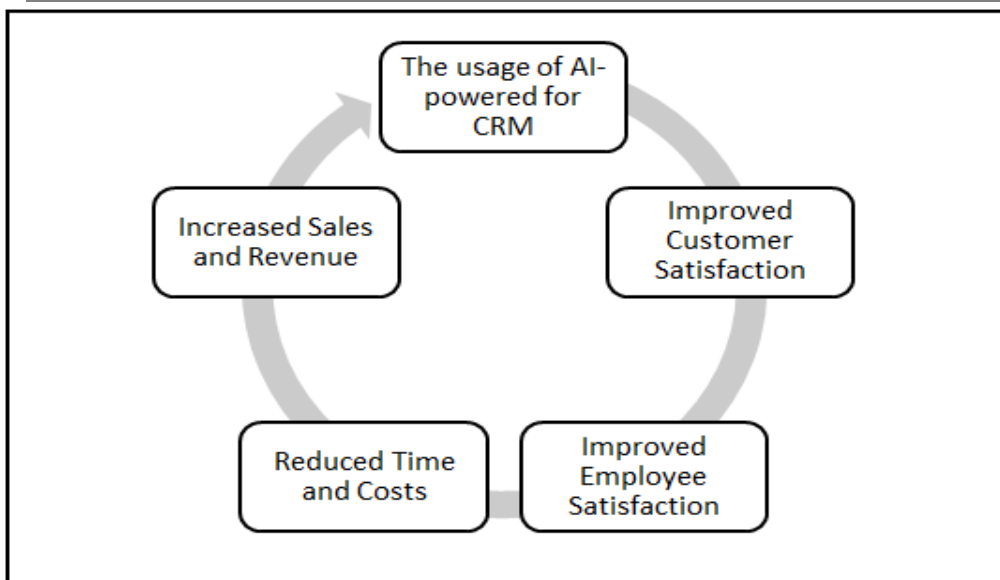


Figure 1 General Benefits of AI with CRM Usage (Kalaiyarasan et al. 2023; Khneyzer et al., 2024)

Figure 1 presented the general benefits of using AI in CRM systems. The use of AI and technology in CRM emphasises the enhancement of customer satisfaction through better service delivery and personalisation. Moreover, the employee satisfaction is achieved by the technology readiness and efficiency usage of AI as the CRM tools. Perpetuated benefits are perceived with the increase of sales and revenue from the efficiency of the CRM process (Kalaiyarasan et al. 2023; Khneyzer et al., 2024).

At another instance, Rizvi (2023) emphasized on the consumption of energy in buildings and argued that on conventional grounds, it has been quite challenging to ensure that energy consumption is efficiently managed. The need for this has increased over time due to the rise in economic and pollution growth. Therefore, there has been this realization that an effective energy management system is required which must work in real-time and in order to do so, AI is used. While Rizvi (2023) did not specifically talk about how AI has improved CRM with respect to energy management, the subliminal message noticed from his work is that when the building’s management is efficient in managing energy and eventually reducing pollution, then inhabitants of the buildings and their customers will eventually find themselves strongly connected to them.

SYSTEMATIC LITERATURE REVIEW

This study used the secondary data sources which have been accessed using online databases, search engines and group publishers such as Scopus, SpringerLink, Google Scholar and, Emerald Insight. The criteria for inclusion for the data sources is that any information which is published in and beyond 2017 is considered. Also, only genuine publications have been considered and any white paper or unreliable source of data such as Wikipedia has been strictly avoided. The systematic literature review technique has been used for assessing the past studies. This technique is useful because it helps in deducing facts and findings from the data about how AI has facilitated CRM to benefit the businesses in property management.

The Adoption of AI and Technology for CRM for Property Management

The findings have shown that one of the imperative areas of business which has been noticeably and unarguably facilitated by AI is CRM. While many businesses had been using AI, such as the ones in asset management sector as claimed by Bartram et al. (2020). A study by Chatterjee et al. (2021) debated that Business-to-Business (B2B) companies have acknowledged the usefulness of AI in CRM for quite some time. The past studies stressed that transitioning from traditional means of dealing with B2B clients to AI-enabled CRM is a massive change which businesses have undergone to elevate themselves strategically. Findings analyzed from the work of Fabian et al. (2024) further validated businesses in the real estate industry even though utilizing AI, they are also aware of the merits and demerits attached to it. It had been highlighted that while performing the responsibilities related to CRM, such as, dealing with customers’ demands, offering them

assistance in their investments, etc. the tasks have become easy with the help of AI in CRM, but the challenges still prevailed.

Table 1 presented the systematic literature review table for the adoption of AI and technology for property management CRM. The past studies show the relevancy of AI and technology adoption for CRM, especially towards the property management sector.

Table 1The Systematic Literature Review Table for the Adoption of AI and Technology for Property Management CRM

Citation	Country	Purpose of Study	Key Findings	Summary of Findings
Bartram et al. (2020)	USA	To explore the application of AI in asset management	<ul style="list-style-type: none"> - AI has improved various aspects of asset management including portfolio management, trading, and risk management. - AI techniques can facilitate fundamental analysis and generate novel investment strategies. - AI can produce better return and risk estimates and solve complex portfolio optimization problems, leading to better out-of-sample performance compared to traditional approaches. 	The paper provides a comprehensive overview of the applications of artificial intelligence and machine learning techniques in asset management, including portfolio management, trading, and portfolio risk management, as well as the use of AI in robot-advising.
Chatterjee et al. (2021)	India	To investigate the impact of AI-CRM adoption in B2B relationships	<ul style="list-style-type: none"> - The transition from traditional B2B relationship management to AI-CRM represents a significant change for organizations. - Successful implementation of AI-CRM is a critical success parameter for organizations in the B2B segment, as relationship management is a strategic activity. - The study examines how the adoption of AI-CRM can impact organizational performance, considering factors such as firm size, firm age, and industry type. 	AI-based CRM can impact firm performance and competitive advantage in the B2B context, depending on firm size, age, and industry.
Fabian et al. (2024)	Germany	To review AI adoption in the real estate industry	<ul style="list-style-type: none"> - The real estate industry has been relatively slow in adopting AI, but AI has the potential to revolutionize the industry in the future. - The adoption of AI in real estate may lead to the displacement of human employees, as AI takes over not just simple tasks but also more complex roles. - The adoption of AI in real estate could lead to positive outcomes for clients, such as more convenient and effective property searches, as well as more accurate and less biased property valuations. 	This paper provides a comprehensive literature review on the application of artificial intelligence (AI) in the real estate industry, covering various use cases and the potential benefits and challenges of AI adoption in the sector.

Potla (2023)	USA	To explore the integration of AI, ML, and chatbots in CRM systems	<ul style="list-style-type: none"> - The integration of AI, ML, and chatbots into CRM systems represents a significant advancement in customer relationship management. - These technologies offer businesses the tools to automate routine tasks, personalize customer interactions, and gain valuable insights into customer behaviour. - While the implementation of these technologies presents challenges, the potential benefits in terms of increased customer satisfaction, operational efficiency, and business growth are substantial. - AI and ML technologies are expected to expand their role in CRM systems in the future. 	This paper explores the integration of AI, chatbots, and ML within CRM systems, highlighting their applications, benefits, and challenges. It provides a comprehensive analysis of how these technologies are reshaping customer engagement strategies and proposes future research directions.
Antão et al. (2024)	Portugal	To analyse AI applications in the real estate sector	<ul style="list-style-type: none"> - Majority of applications relate to price forecasting and property valuation. - Findings underscore the significance of areas such as personalized strategies for clients, real estate recommendation systems, and process automation. 	The article presents a Multivocal Literature Review (MLR) on the use of Artificial Intelligence (AI) in the real estate sector, aiming to analyse existing applications, literature gaps, and current challenges.
Bouchar eb (2023)	France	To study the impact of AI on Hotel Property Management Systems	<ul style="list-style-type: none"> - This paper delves into the impact of Artificial Intelligence (AI) on improving Hotel Property Management Systems (PMS) and the integration of AI technology within the hospitality industry. - AI-driven PMS handles dynamic pricing strategies, real-time brand monitoring, and streamlines operational tasks. - It emphasizes the growing importance of AI in the hotel sector, where technology plays an increasingly central role in delivering personalized guest services, improving hotel operations, and ensuring guest satisfaction. 	This paper investigates how Artificial Intelligence (AI) can improve Hotel Property Management Systems (PMS) in the hospitality industry. It demonstrates how AI-driven PMS significantly improve efficiency in operations, making hotels more competitive in a dynamic landscape. The paper highlights the practical significance of AI in the hospitality industry.
Rane (2023)	India	To examine the integration of AI, IoT, and Big Data in customer loyalty	<ul style="list-style-type: none"> - The study showed how AI, IoT, and Big Data technologies can enhance customer satisfaction, engagement, relationships, and experiences. - IoT technology enables the collection of real-time customer data for personalized experiences. - AI models help businesses customize their offerings to meet evolving 	This paper examines how the integration of Artificial Intelligence (AI), Internet of Things (IoT), and Big Data technologies can be leveraged to enhance various aspects of customer loyalty, including satisfaction,

			customer needs. - Big Data technology enables organizations to extract actionable insights from large datasets to improve customer loyalty.	engagement, relationships, and experiences.
Lui (2021)	China/Hong Kong	To explore the use of AI in property management for harmonious communities	- This research explores the effects of AI facilities in residential estates in Hong Kong and mainland China. - Three studies were conducted, showing AI outperforms traditional human-led property management in service efficiency. - AI facilities increase service efficiency, promote happiness, enhance fairness, and reduce complaints.	This research concluded that AI facilities in residential estates increase service efficiency, promote happiness, enhance fairness, and eliminate complaints. The studies conducted in both Hong Kong and mainland China highlighted the positive outcomes of implementing AI in property management services.
Ozay et al. (2024)	Turkey	To provide insights into AI-CRM research evolution	- The study analysed 810 articles on AI-CRM research over the past two decades and identified seven predominant themes. - The COVID-19 pandemic accelerated AI-CRM research. - The study provides a comprehensive overview of AI-CRM research domains and historical developments.	This paper provides a bibliometric and systematic literature review of AI integration into Customer Relationship Management (CRM) within enterprise information systems, offering insights into the historical developments, state-of-the-art, and research domains in this field.
Naz et al. (2022)	Pakistan	To review the role of AI in property management post-COVID-19	- The COVID-19 pandemic has significantly disrupted the real estate sector. - There is a growing research focus on the role of AI in property management, especially after 2019. - The paper proposes several research directions for using AI techniques in addressing property management challenges in the post-COVID-19 era.	This paper provides a systematic literature review on the role of artificial intelligence (AI) in property management, with a focus on the impact of the COVID-19 pandemic on the real estate sector.

Other significant findings have been obtained from the research paper of Potla (2023) from where it has been noted that CRM is enhanced using AI because of the tools it powers, such as, machine learning and chatbots. It had been critiqued that while customer representatives from the companies are not always available, businesses make use of chatbots where they incorporate anticipated questions and their possible answers to facilitate the customers. This happens when the customers visit companies' websites or social media pages and they receive a pop-up which is actually a chatbot. It assists them in their initial search only and the customers can always connect with the human representative of the company afterwards.

It is also found from the work of Potla (2023) that besides chatbots, machine learning has also been a frequently used tool to improve the effectiveness of CRM. However, it had been critiqued that while the incorporation of AI and its tools fascinate the businesses, it also brings along some challenges. One of the challenges that had been highlighted is risk of data quality; that is, the AI-enabled tools like machine learning

work best only when the quality of available data is good. Low quality data is not processed well by the AI systems; risking the accuracy and efficiency of the results. Other challenges include complexity in understanding AI and its tools for CRM and the cost which incurs in their installation.

Review of Important Findings

In addition to the findings presented by Table 1, this study identified some other important literature that have been obtained through systematic literature review. For instance, it has been found from the contribution to literature by Antão et al. (2024) that companies which are in the real estate business have incorporated artificial intelligence in their CRM because it has enabled them to devise strategies on personalized basis for customers individually. In addition to this, AI-enabled CRM also allows property management businesses to upgrade their systems for personalized recommendations along with process automation. Other important findings of this paper are acquired from the notion of Bouchareb (2023) who critiqued that hotel proper management systems have embraced a massive shift from manual and conventional approaches and systems to AI-infused ones to ensure greater satisfaction of guests with high efficiency and effectiveness. These findings have proven that AI has definitely elevated the way traditional CRM used to be done.

It has further been found from the extensive research work of Rane (2023) that businesses have been focusing upon enhancing the loyalty of their customers by seeking assistance from AI. The researcher critiqued that the introduction of AI-enabled tools such as big data technology and Internet of Things (IOT) have been a major contributor towards ensuring that not only engagement and interaction with customers would increase, but also towards their satisfaction. The past research provided evidence that AI-enabled tools, such as IOT always guaranteed greater and stronger connectivity between businesses and their clients, which means that all concerns of the customers and any query which they might have can be resolved promptly.

On the other hand, big data technology and predictive analytics enabled businesses to anticipate the possible scenarios, identify the challenges, and prepare the responses in advance such as in the form of Frequently Asked Questions (FAQs). All such practices have only been possible due to AI and have proved to be the key in enhancing and strengthening relationships between customers and businesses. It was further found that ever since AI has come at their disposal, companies have shown notable interest in gathering customers' data in real time so that they may undergo predictive analysis accordingly and make decisions which are informed and calculated as well. Thus, these findings have confirmed that companies are taking great measures with the help of AI to strengthen their relationships with customers.

Other aspects of results have been extracted from the findings of Lui (2021) who asserted that AI suggested that 'harmonious communities' should be built across China and Hong Kong. The researcher stressed that businesses in the property management domain in China and Hong Kong have realized that incorporating AI is an effective and definite way of building communities in a peaceful and prosperous manner. Apart from this, analysis of findings from Ozay's et al. (2024) work revealed that companies have merge the Enterprise Information System with CRM and have used AI to facilitate these. The direct benefits are increasing efficiency of their operations and enhance engagement with customers at the same time. On the other hand, Naz et al. (2022) shared a distinctive view on the use of artificial intelligence by property management companies; that is, the post-COVID stance. The researchers argued and provided validation that the sudden occurrence of COVID had disturbed industry operations for property management businesses, but the use of AI turned out to be of massive assistance for them.

Therefore, the findings of study contributed noticeably to the existing body of knowledge in a way that it emphasizes upon pointing out the specific tools of AI which are extensively in use by the property management companies with regards to their CRM. In contrast, past studies, such as the one conducted by Chatterjee et al. (2020) as well as the one by Łukasik-Stachowiak (2023) claimed that AI is not only being used by companies for the sake of experiencing perceived ease of use and perceived usefulness but also encompasses several opportunities and threats. However, the integration of AI tools with CRM in property management delivers significant advantages to companies by enabling more effective and tailored services for customers.

The implications of this study's findings will help practitioners of the property management; in particular, customer relationship managers from property management companies, to retain and further strengthen their relationships with existing customers. The findings will also be helpful in building new business relationships. This is because the businesses will be able to realize the importance of incorporating AI in CRM and use its tools like personalized marketing, internet of things (IOT), and predictive analysis, specifically to help customers or clients get the best service.

CONCLUSION

Overall, the research paper concludes that the findings were able to accomplish the aim; that is, it has been substantiated that the use of AI in CRM has become somewhat a must for property management businesses. The systematic literature review proved through the examples of real estate businesses that property management required handling sensitive information of clients and demand informed decision making and personalized services and marketing. All of this had only been possible due to AI-enabled tools which are used in CRM such as big data analysis and internet of things (IOT), with predictive analysis.

Other researchers can consider these future directions in order to tap areas which remained unaddressed in this research. Therefore, the first area where investigation can be conducted further is to determine on how the property management businesses tackle the challenge of cost overruns which occur due to overpricing of the AI-enabled tools when embedded in CRM software. Researchers in the future can identify the strategies which property management businesses can undertake to ensure smooth management of their customers while using AI to its optimum.

ACKNOWLEDGEMENT

The authors would like to express my sincere gratitude to Universiti Teknologi Malaysia for providing the resources and facilities necessary for this study. This research was funded by Universiti Teknologi Malaysia and Ministry of Education through the UTM Encouragement Grant (Cost Center No: Q.J130000.3852.31J56) and the Fundamental Research Grant (FRGS) (Cost Center No: R.J130000.7852.5F724).

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