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APPLICATION OF ARTIFICIAL INTELLIGENCE TECHNOLOGY IN CUSTOMER RELATIONSHIP MANAGEMENT TO IMPROVE CUSTOMER RETENTION

Loso Judijanto *[1]
IPOSS Jakarta, Indonesia
losojudijantobumn@gmail.com

Rachmadi Indra Praja
PT. Pupuk Kaltim
rachmadi.indrapraja@pupukkaltim.com

Syaiful Pakaya
Universitas Ichsan Gorontalo
tapol2012@gmail.com

Al-Amin
Universitas Airlangga, Surabaya, Indonesia
al.amin-2024@feb.unair.ac.id

Abstract

The application of artificial intelligence (AI) technology in customer relationship management (CRM) systems has become a key focus for companies seeking to improve customer retention in the digital age. Artificial intelligence offers deep data analysis capabilities and personalisation of customer service, which are key in delivering a satisfying customer experience and increasing their loyalty. The research method used in this study is the literature research method. The results of this study show that the integration of AI in CRM has great potential in improving customer retention, but requires a careful implementation strategy to overcome the challenges and maximise the potential benefits.

Keywords: *Artificial Intelligence Technology, Customer Relationship Management, Improving Customer Retention.*

Introduction

Companies operating in today's competitive business environment are constantly looking for ways to retain their customers. The secret to success lies not only in the acquisition of new customers, but much more importantly in their retention.

In the modern business world, customer retention is a critical component that determines business sustainability and growth. Keeping customers loyal is more economical than constantly looking for new customers. The cost of acquiring new clients is often greater than the effort to retain existing ones (Agnihotri, 2021). Loyal customers not only keep buying, but also tend to buy more over time. Steady income

[1] Correspondence author

from repeat customers helps companies plan future investments and expansions more easily. In addition, satisfied customers often spread positive references and recommendations that can bring new customers without additional acquisition costs (Al-Araj et al., 2022).

Furthermore, customer retention also contributes to brand strengthening and market reputation. A brand that has a high customer retention rate reflects high customer satisfaction, which indirectly appeals to potential buyers. In today's digital era, reviews and testimonials from loyal customers can quickly influence public perception of a brand (Alkitbi et al., 2020). Through effective customer retention strategies, companies can build and maintain customer trust and loyalty, which are valuable assets in increasingly fierce business competition, especially in the face of market changes and dynamic consumer needs (Allal-Chérif et al., 2021).

Therefore, customer retention has become a key focus in business strategy to ensure a continuous revenue stream and build a loyal customer base.

The development of information technology, particularly artificial intelligence (AI), has provided new tools that promise significant improvements in customer relationship management (CRM) (Alshurideh, 2022). One of the keys to successful CRM is the ability to provide personalised experiences that are responsive to customer needs and preferences. AI technology offers great potential in automating interactions, gaining insights from big customer data, and improving efficiency and effectiveness in customer communications (Alt & Reinhold, 2020).

However, although various studies have shed light on the use of AI in CRM, its real-world application in the industry is still fraught with challenges. Companies must face the technology learning curve, integrate existing systems with AI solutions, and address ethical and data privacy concerns. The success of this integration is inseparable from a deep understanding of how AI can be applied to maximise customer retention (Ameen et al., 2021); (Anica-Popa et al., 2021).

Awareness of the importance of AI in CRM has grown, but there is still a gap in the literature regarding the practical application of AI to improve customer retention. Therefore, this research intends to bridge that gap by examining the application of AI in CRM, providing insights into its effectiveness, and exploring ways in which AI can be implemented to bring concrete benefits to creating loyalty and retaining customers.

By analysing related literature, this research aims to generate a deeper understanding of how AI can play a role in increasing customer retention gifs, ultimately providing strategic recommendations for companies looking to leverage AI to optimise their CRM.

Research Methods

The study conducted in this research uses the literature research method. Literature research method, or often referred to as literature study or literature review, is a systematic process of collecting, evaluating, and synthesising existing research results relevant to the research topic or question. (Firman, 2018b); (Firman, 2018a); (Helaluddin, 2019).

Results and Discussion

Customer Retention Theory

Customer retention is defined as the efforts an organisation makes to retain as many of their customers as possible so that they do not switch to competitors. This activity involves a series of actions and strategies designed to provide satisfaction and value to customers, thereby triggering a desire to continue doing business with the company (Babatunde et al., 2024). The goal is to build long-term profitable relationships with customers by deeply understanding their needs and preferences, offering high-quality service and support, and continuously introducing product or service improvements that match the evolution of their needs (Bag & Rahman, 2023).

The importance of customer retention to the success of a business cannot be ignored. Firstly, loyal customers tend to be more profitable carrying lower costs compared to the cost of acquiring new customers, which often involves significant marketing and promotional costs. Second, loyal customers are able to increase revenue through repeat purchases and larger purchases over time (Balmer et al., 2020). Then, satisfied customers are often an effective source of word-of-mouth, influencing the purchases of others and thus, aiding the addition of a customer base at no additional cost to the company. Therefore, customer retention becomes another key aspect of competitiveness, helping companies not only survive, but also thrive in a crowded and competitive market (Banu et al., 2022).

Factors affecting customer retention are manifold and complex, including product or service quality, customer experience, relative price, as well as the emotional aspects of the customer-company relationship. Product or service quality is fundamental; customers tend to remain loyal if they feel that what they get meets or exceeds their expectations (Basri, 2020). This aspect also includes reliability, consistency, and the features or benefits offered by the product or service. On the other hand, the customer experience-from the initial interaction, to the purchase process, to after-sales support-should be seamless, satisfying, and free of obstacles or disappointments. This positive experience creates a good impression and increases the likelihood of customers continuing to interact with the brand (Bharadiya, 2023).

In addition, customers' perception of the value they get compared to the price they pay also greatly affects retention. Customers tend to stay loyal when they feel they are getting appropriate or better value for their investment (Bhardwaj et al., 2020). Price competition can be a factor, but experience and quality are often more important

in measuring overall value. Emotional factors, such as personal attachment and trust in the brand, also play a key role. Customers who feel a personal, even emotional, connection with a brand are more likely to ignore offers from competitors (Borges et al., 2021). This attachment can be strengthened through effective communication, loyalty programmes, and demonstrated commitment to social or environmental responsibility, all of which contribute to the formation of long-term customer loyalty and retention (Bounatirou & Lim, 2020).

Customer Relationship Management (CRM)

Customer relationship management (CRM) is a business strategy that focuses on understanding, anticipating, and meeting the current and future needs of customers in an effort to build and maintain long-term profitable relationships (Brill et al., 2022). CRM integrates information technology, business processes, and all marketing activities to know customers better and provide more personalised and relevant services. It is a holistic approach that involves every point of contact with the customer, from the initial sales interaction to after-sales support, with the aim of increasing customer satisfaction and maximising revenue. CRM helps companies optimise their business processes, improve efficiency, and provide tools for in-depth customer analysis, enabling more informed decision-making and responsiveness to market needs (Bruyn et al., 2020).

The key components of CRM include technology and software, processes, people, and data. Basically, CRM technology refers to systems and applications that support the collection, storage, and analysis of customer data. This includes software for customer relationship management that provides functionalities such as contact management, sales automation, customer support, as well as digital marketing automation (Cao, 2021). Processes include methodologies for handling interactions with customers, product development, and implementation of customer service strategies. Human factors, or people, relate to how employees and management interact with the CRM system and use the information provided to improve customer relationships (Capuano et al., 2021). Finally, customer data is at the heart of CRM, including demographic information, purchase history, preferences, behaviour, and feedback, all of which are used to deepen understanding of customers and serve them more effectively (Chatterjee et al., 2020).

Conventional methods in Customer Relationship Management (CRM) often rely on a more manual and personalised approach, using instruments such as phone calls, direct mail, face-to-face meetings, and personal relationship networks to build and maintain relationships with customers (Chen et al., 2022). In the pre-digital era, customer data was collected and managed through physical storage systems such as index cards or paper records and simple computer databases. This involved sales and marketing staff actively tracking customer interactions, utilising sales records, after-sales feedback, and customer service activities to personalise communications and

ensure that customers felt valued and important. While not as efficient as modern, fully automated CRM systems, these conventional methods are often able to create feelings of intimacy and loyalty through a more tangible human touch and individualised attention to customer needs and preferences (Cheng & Jiang, 2022).

Artificial Intelligence (AI)

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to learn, analyse and solve problems automatically. AI encompasses a range of technologies, including machine learning, natural language processing (NLP), computer vision, and robotics, that enable machines to exhibit aspects of intelligence such as understanding, planning, recognition, and creativity (Chintalapati & Pandey, 2022). Based on the ability to receive data, process it, and make informed decisions or predictions, AI can be applied in areas ranging from data analysis, business process automation, product development, to user service innovation. This concept of artificial intelligence, which was initially theoretical and limited to philosophical thoughts on the mimicry of human intelligence by machines, has evolved into one of the most dynamic and impactful technological fields of modern times (Dastane, 2020).

The development of AI can be traced back to the mid-20th century, with its important milestone in 1956 during the Dartmouth Conference, which is considered the birth of artificial intelligence as a scientific discipline. Since then, AI has experienced several AI winters-periods where interest and funding dropped drastically due to overly high expectations and slow technological progress (Devan et al., 2023). However, since the beginning of the 21st century, advances in cloud computing, growing data storage capacity, and breakthroughs in machine learning algorithms have fuelled a new boom in AI research and applications. The success of applications such as product recommendations, virtual assistants, and AI-based medical diagnosis systems has demonstrated its tremendous potential to transform industries, economies, and other aspects of human life, promising increased efficiency, innovation of new products and services, and deep insights into data that previously could not be processed manually (Enholm et al., 2022).

In the world of business and industry, AI applications have become a catalyst for digital transformation and increased productivity in various sectors. AI is used to automate routine and repetitive tasks, saving time and costs, and reducing the possibility of human error. Machine learning, a branch of AI, in particular has had a huge impact, enabling companies to analyse large volumes of data and gain valuable insights to improve the decision-making process (Esch & Black, 2021). Examples of AI applications in business include personalisation of customer experience through smart recommendations, chatbots that manage customer service queries, as well as predictive algorithms used in supply chain management to optimise inventory and

logistics. In the marketing space, AI tools enable companies to launch targeted campaigns based on analysis of customer behaviour data, strengthening customer retention and new customer acquisition strategies (Payne et al., 2021).

Meanwhile, in the context of the manufacturing industry, AI plays an important role in the development of intelligent manufacturing systems. This includes the use of AI-powered automated robots to improve the efficiency of production processes and predictive maintenance that utilises sensors and machine learning to predict and prevent equipment failures before they occur (Flavián et al., 2022). In the financial sector, companies are utilising AI to carry out in-depth risk analysis, fraud detection, and natural language processing to read and interpret massive financial documents at speeds impossible for humans to achieve (Gao et al., 2023). In healthcare, AI has shifted from being just a research tool to a core part of diagnosis and treatment, providing great accuracy in medical image processing, designing personalised treatment plans, and even assisting in drug and vaccine research. It is thus clear that AI has become a force driving innovation and competitive advantage in some of the most important areas of business and industry (Gigante & Zago, 2023).

AI in CRM

The integration of Artificial Intelligence (AI) in Customer Relationship Management (CRM) systems has brought about a major revolution in the way companies interact and maintain relationships with their customers. Using AI, CRM systems can now intelligently analyse large customer data in real-time to provide deeper insights into customer behaviour and preferences (Grandinetti, 2020). This allows companies to tailor their communications and product or service offers more specifically and personally, thereby increasing customer satisfaction and loyalty. In addition, AI also enriches CRM with the ability to make accurate predictions about future market trends and customer behaviour, allowing companies to proactively adjust their business strategies (Grewal et al., 2021).

In addition, AI also optimises the operations and work efficiency of sales and customer service teams. With AI, routine tasks such as data entry, scheduling, and even most initial interactions with customers can be automated, freeing up time for teams to focus on more strategic tasks and building deeper relationships with customers (Guerola-Navarro et al., 2022). Features such as AI-powered chatbots and virtual assistants can provide quick and personalised responses to customer queries or issues, improving the speed and quality of customer service. The integration of AI in CRM is not just about technological enhancement, but also about changing the way companies approach and manage customer relationships, which will ultimately solidify their position in an increasingly competitive market (Haleem et al., 2022).

In the world of CRM, Natural Language Processing (NLP) is one of the most critical AI technologies in improving the interaction between humans and machines.

NLP enables systems to understand, analyse, and respond to human language in a natural and meaningful way (Han et al., 2021). In the context of CRM, NLP can be used to process data from customer communications such as emails, phone calls, and social media to understand sentiment, extract key information, and categorise topics of discussion. This technology is particularly useful in identifying customer moods and intentions, which allows companies to respond more effectively and personally (Hentzen et al., 2022). In addition, NLP also facilitates the creation of more sophisticated Chatbots, which can have conversations with customers naturally, providing relevant responses based on the context of the conversation (Hoyer et al., 2020).

Machine Learning (ML) in CRM helps in predicting customer behaviour and automating data-driven decisions. Using machine learning algorithms, CRM systems can model historical customer data to identify certain patterns and trends that are invisible to the human eye. This allows companies to target customers with personalised offers based on previous behaviour and projected preferences (Huang & Rust, 2021). In addition, ML plays an important role in customer segmentation, refining sales and marketing processes to maximise conversions. The application of ML in CRM not only improves operational efficiency but also provides a more responsive and adaptive platform to serve customer needs dynamically (Hussain et al., 2023).

Chatbots, powered by AI technologies such as NLP and ML, have become an essential component in modern CRM. They provide continuous customer service without the need for human intervention, which improves customer service availability and efficiency. Chatbots are effective in handling routine and transactional queries, freeing up human agents to handle more complex and nuanced issues (Jenneboer et al., 2022). In addition, chatbots can also be integrated with various communication platforms, such as websites, mobile applications, and social media, providing a consistent and seamless experience for customers. The application of chatbots in CRM not only reduces operational costs but also increases customer satisfaction through quick and accurate responses to their requests (Khrais, 2020).

In conclusion, the integration of Artificial Intelligence (AI) technologies such as Natural Language Processing (NLP), Machine Learning (ML), and chatbots into Customer Relationship Management (CRM) systems has significantly changed the landscape of customer interaction and relationship management. These technologies enable companies to better understand and respond to customer needs and preferences more effectively and personally. NLP enhances the system's ability to interact with customers using natural language, while ML facilitates the analysis of customer patterns and behaviour to predict their future needs. Meanwhile, chatbots offer an efficient and cost-effective way to provide 24/7 customer support. Together, AI applications in CRM not only optimise customer experience, but also drive operational efficiency and smarter data-driven decision-making, cementing relationships between companies and customers and supporting long-term business growth.

AI Barriers and Challenges to Customer Retention

The use of Artificial Intelligence (AI) in improving customer retention certainly brings many advantages, but it also has some barriers and challenges. Among them are privacy and data security issues. In processing massive customer data, very strict data security is required to prevent leakage of sensitive information (Kolasani, 2023). The potential misuse of data can result in huge losses, especially in terms of customer trust. Ensuring that all data is processed and stored securely is a major challenge, especially with regulations such as GDPR in the European Union that require companies to manage personal data more carefully (Kshetri, 2021).

Furthermore, there is the challenge of deep contextual understanding in communication. While AI, particularly through the use of NLP, has made progress in understanding and interpreting human language, there are still limitations in understanding the deeper subtextual context or nuances in interpersonal communication (Kushwaha et al., 2021). This can result in misinterpretation of needs or responses that do not match the customer's actual emotions or conditions. Consequently, this can lead to customer frustration and potentially damage relationships rather than strengthen them (Lamrhari et al., 2022).

Another challenge is the over-reliance on technology that can reduce the human touch in customer service. AI can handle many tasks automatically and improve efficiency, but empathetic and personalised human interaction remains irreplaceable, especially in dealing with complex or highly sensitive issues (Ledro et al., 2022). The loss of "real" human interaction can have a negative impact on the customer experience, where customers may feel they are interacting with a machine that does not fully understand or care about their problems.

Finally, the challenges of efficient implementation and integration of AI technologies cannot be ignored. It requires significant investment in both technological and human resources to develop, test, and manage AI (Libai et al., 2020). Issues such as incompatibility of the technology with existing IT systems, training needs for staff, and large technology infrastructure management costs are part of the obstacles to be faced. These operations require not only large initial capital but also ongoing maintenance and upgrades to ensure that AI systems continue to be relevant to business needs (Limna, 2023); (Lv et al., 2022).

Facing these barriers and challenges requires a careful and strategic approach, where the successful implementation of AI in CRM depends not only on the technology, but also on the ability to integrate the technology with the overall business and customer retention strategy.

Conclusion

The application of artificial intelligence (AI) technology in customer relationship management (CRM) is proving to be a crucial strategy to improve customer retention. Through the integration of AI technologies such as intelligent recommendation systems, automated personalisation and responsive chatbots, businesses can provide more personalised and responsive services, driving higher customer satisfaction. These technologies allow companies to dig deep into customer data, identifying patterns of customer behaviour, preferences and needs, so as to provide more tailored services or products. AI also enriches the customer experience through more convenient and faster interactions, ranging from handling simple queries to offering solutions tailored to customers' specific needs, all done with increased speed and accuracy.

However, the implementation of AI in CRM also faces challenges, including the need for strict data protection, adaptation to complex communication contexts, maintaining a balance between automation and human touch, and dealing with the cost and complexity of implementation. Despite these challenges, AI deployments have shown a significant positive impact on customer retention. By continuing to focus on developing and customising effective AI technologies, companies can achieve dual benefits: increasing customer satisfaction while improving operational efficiency. This approach not only helps in retaining customers but also strengthens the company's competitive position in the market.

The implications of implementing AI in CRM systems for customer retention are far-reaching, driving a positive transformation in the way companies interact and retain their customers. With the ability to process and analyse customer data in a massive and real-time manner, AI helps companies in offering more personalised and proactive services, which not only increases customer satisfaction but also strengthens long-term customer loyalty. Additionally, AI helps in identifying upsell and cross-sell opportunities through a better understanding of customer behaviour and preferences, while optimising operations and reducing costs through efficient automation. However, these positive impacts must be coupled with careful management of customer data privacy and security, aiming to build trust and fulfil customer expectations in today's digital age.

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