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STUDY OF ARTIFICIAL INTELLIGENCE AND ITS IMPLICATIONS IN THE IMPLEMENTATION OF CRM TECHNOLOGY

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ABSTRACT

This study investigates the impact of AI integration in CRM technology on three critical aspects: AI-based customization, enhanced customer database, and AI integration in the CRM operations. The first research question was to establish whether there is a substantial enhancement of these aspects of CRM systems with the integration of AI. In the present study, the research used a sample of 100 respondents and adopted a quantitative research method with a random sampling technique to collect data. The use of descriptive statistics and Pearson correlation analysis was employed in the analysis of the relationship between the independent variable and the dependent factors. The analysis showed that there were low and insignificant association between the levels of AI integration and the three dependent variables. More particularly, the results revealed that the degree of AI integration was significantly but weakly and negatively related with the extent of AI personalisation (r = -0. 181), AI customer data management (r = -0. 104) and AI automation (r = -0. 134). The results of this study indicate that, counter to assumptions, AI integration did not significantly improve personalization, data handling, or the automation of CRM systems. Therefore, the study concludes that the expected positive effects of AI on the CRM functionalities were not observed in this sample, suggesting deficiencies in existing AI applications or their incorporation into CRM systems. The results point to the need for more research that can help to establish the efficiency of AI tools, how these tools can be fine-tuned and how they can be aligned to the objectives of CRM. If these factors are managed, they might assist with the realization of the potential of AI in redefining CRM systems. Thus, the findings of this research stress the need for further development of the AI tools and the elimination of the practical issues that hinder the enhancement of CRM performance.

Keywords: AI Integration, CRM Technology, AI-Driven Personalization, Customer Data Management, and AI-Enabled Automation

INTRODUCTION

AI has become a popular trend in CRM technology by enhancing the ways by which the organizations communicate with their customers, collect data, and complete tasks (Iqbal & Khan, 2021). Al has becomes a vital tool for organizations in their bid to boost up their CRM systems in the current world that is experiencing rapid technological advances (Dixit, 2022). CRM platforms have not only become the places where customer data are stored but also the tools that are enabled by AI technologies including machine learning, natural language processing, predictive analytics, and automation to actively enhance the customer experience, organisational performance, and decision-making(Sofiyah et al., 2024). AI is not just augmenting CRM but is providing organizations with options vastly superior to traditional approaches and more adaptable and more responsive strategies of customer management(Agnihotri, 2021).

Integrating AI into CRM systems has one of the most notable impacts for the adjustment of AI, personalized into

customer relationships(Chagas et al. , 2018). In a way, customer satisfaction and loyalty remain the key strategies that are now enhanced by the application of AI in personalization. Because of AI, CRM systems can collect and process large quantities of customer data to find patterns, preferences, and behaviours that will allow businesses to create, communicate and deliver personalised messages and solutions to its customers(Galitsky, 2020). From the change from standardized processes to intensive customer experiences, there has been much improvement in customer interactions and satisfaction as well as in the efficacy of marketing and selling. The aspect of AI to recognize the need of the consumer and offer appropriate content at the right time has revolutionized personalization in CRM making it an important tool for any business that is interested in improving the customer relation (Deb et al. , 2018).

Besides, personalization, AI has also transformed the management of customer data in CRM systems (Rahman et al. , 2023). In the past, controlling and analyzing the customer data was a cumbersome and often inaccurate operation. However, with the help of AI, CRM systems can analyze the increased amount of data more effectively and faster and provide information that was otherwise impossible to obtain(Venkataramanan et al. , 2024). Through advanced data management, businesses can make the right decisions about the market, anticipate customers' actions, and find factors that will affect future actions. In addition, the use of AI in managing data aspects minimizes the need to perform repetitive tasks, which would otherwise take much time. The end product is a method for the handling of customer data that is more effective, precise and conducive to providing accurate and actionable business intelligence which is crucial in the creation of long-term customer relationships (Sadhu et al. , 2024).

Moreover, it is evident that AI has enjoyed a major influence on the extent of the automation of the CRM activities and various customer related and internal activities(Li et al. , 2023). This means that through the different processes that involve the use of AI the business can run more smoothly as it performs the common customer service inquiries, marketing, and sales processes with little to no errors. Not only does the automation feature of AI minimize the time and energy needed to perform CRM operations but also enhances the accuracy and effectiveness of these functions(Saura et al. , 2021). This has in turn resulted to improved production, effective service delivery to customers, and proper utilization of resources in organizations. In the future, as AI advances further, the use of the technology in CRM process automation is only set to grow, meaning businesses will have even more ways to improve their operations, and their interactions with customers in particular(Agnihotri, 2021).

HYPOTHESIS

1. **Null Hypothesis (H_0):** There is no significant relationship between the integration of AI in CRM technology and AI-driven personalization in CRM.
2. **Null Hypothesis (H_0):** There is no significant relationship between the integration of AI in CRM technology and AI-enhanced customer data management.

REVIEW OF LITERATURE

The cross-sectional study by Chatterjee et al. (2020) aimed to find out the BI of the employees to use the AI integrated CRM systems in organizations of India. It found out that perceived usefulness and perceived ease of use are the major factors affecting the adoption intentions. This study also showed that these factors also affect behavioural intentions through antecedent variables such as utilitarian and hedonic attitudes. The proposed theoretical model that was used had a predictive power of sixty-seven percent; it made a theoretical contribution by incorporating leadership support as a moderator that had not been tested before. This research implies that the benefits of implementing AI-integrated CRM systems in organizations must be well explained and the working of such systems must be made as easy as possible to encourage the uptake. Thus, the study underlines the need for developing a supportive organisational environment for employees, and therefore makes a considerable contribution to the existing body of knowledge about the adoption of AI in Indian organisations.

Chatterjee et al. (2021) investigated the implementation of AI-embedded CRM systems (AICS) in agile organisations as a component of their digital transformation plan. They further extended the literature to formulate and empirically test a conceptual model using PLS-SEM with a sample of Indian organisations. The study found out that perceived value and perceived ease of use affect the adoption of AICS and employee trust and attitude were determined to have an influence on the adoption intention of AICS. In this respect, the findings stress out the significance of the fit between organisational flexibility and the perceived advantages and ease of AICS. These findings provide managerial implications to organisations that require to make improvements to their digital transformation by using AI and it create directions for additional research to understand more about the factors that

affect AI implementation in organisations.

In their article, Krishna et al. (2022) discussed the development and future of Customer Relationship Management (CRM) systems with a special emphasis on the application of artificial intelligence (AI) and internet of things (IoT). The study also showed how such sophisticated technologies allow firms to have permanent supervision of the customers and their interactions, as well as to improve the gathering of information on purchasing behaviours and customer loyalty. CRM automation allows organisations to address customer needs quickly, optimise satisfaction rates, and increase long-term loyalty, which is a key driver of growth and profitability. Multiple correspondence analysis and clustering were employed in the research to derive a conceptual framework for the area of CRM and data mining based CRM. The study also noted a clear shift to the adoption of machine learning and AI techniques in CRM research, which the authors deemed to be an interesting area for future research. As this study shows, there is a need to embrace new technologies to enhance CRM and this study provides a preview into new directions for CRM research.

Kumar, et al. (2023) has studied the use of AI CRM system in the healthcare industry to fill the literature gap in relation to how such technologies impact on service innovation. Utilising a combination of quantitative and qualitative data and using resource based theory and dynamic capability theory and the productivity paradox the study was able to create a framework to examine the AI enabled CRM capabilities and the effects on service innovation. This research revealed that there is a previously unrecognised and critical element in this process: customer service flexibility (CSF). Hypothesis testing through PLS-SEM showed a positive direct linear relationship between AI-enabled CRM capabilities, CSF and service innovation. In addition to addressing a significant research gap, this study provides important information to improve innovative performance in healthcare. The study presents theoretical contributions for the development of CRM literature and practical implications for managers who seek to enhance service results and adopt AI technologies in a dynamic environment.

Mullangi et al. (2018) examine how the use of reciprocal symmetry principles in combination with artificial intelligence, or AI, in customer relationship management, or CRM, systems can be transformatio Their study, adopting the review strategy of secondary data accumulation, makes an assessment of how the integration of the AI-controlled CRM systems along with the principles of the reciprocal symmetry to reshape corporate practices and contribute to sustainable growth in accordance with the current reports, academic studies, and findings. This integration, as the research shows, adds more depth to personalisation, encourages teamwork in innovation, and underlines the centrality of customer needs, which makes AI a key driver of a customer-centric approach. But the study also has also pointed out the importance of having proper regulations to deal with data protection, and ethical issues involving artificial intelligence. Policy considerations call for the development of rules and regulations that would protect consumer interests, diagnose the appropriate use of AI, and set the benchmarks for the AI-driven CRM strategies. The research signifies the immense AI and reciprocal symmetry to transform the corporate relations and innovation more in line with customer orientation.

METHODOLOGY

Research Design: The research will use descriptive research strategy to assess the correlation between the application of AI in CRM technology and its effect on AI based personalization of customer experience, AI based customer data management, and AI based automation of CRM business processes. It is, therefore, the intention of this study to examine the (dependent) factors impacted by the integration of AI within CRM systems. This design enables the researcher to study the variables as they occur naturally and not altered and, therefore, gives indications of the strength and direction of the relationships.

Population and Sample: The target population in this study will involve customers who deal with companies that have incorporated AI CRM technologies. In the current study, a sample of one hundred respondents was used and this was through the use of random sampling techniques. This method also improves the generality of the outcome since every person in the population has the same probability of being selected in to the study..

Data Collection Methods: The study data was obtained by administering a structured questionnaire to the identified sample. The survey was developed in a way that the respondents were asked questions about their thoughts and perception on AI implementation in CRM systems and the efficiency of personalization, data handling, and automation that it comes with. This method of random sampling was used to reduce prejudice and to increase a chance of coming across a more generalized populace.

Variables and Measurements

Independent Variable:
o Integration of AI in CRM Technology: Defined, by the extent of machine learning, natural language processing, predictive analytics, and automation tools implemented in the CRM system.
Dependent Variables:
o AI-Driven Personalization in CRM: Calculated by the self-reported degree of personalisation of customer interactions as a result of AI.
o AI-Enhanced Customer Data Management: By the extent of the customer data management success and efficiency impacted by Artificial Intelligence.
o AI-Enabled Automation in CRM Processes: In this case, the degree of automation that has been accomplished in the CRM processes because of the adoption of AI technology is used as the yardstick.

Data Analysis Techniques: Statistical analysis of the collected data was done using Pearson correlation analysis, executed in the SPSS. This statistical technique was used to find out the nature and extent of the relationships between the independent variable (integration of AI in CRM technology) and the dependent variables (AI-personalization, AI- customer data management, AI-automation). Since the variables were continuous, summary statistics and Pearson correlation coefficients were used to determine if any of the variables were significantly related and the p-values of the coefficients were compared to determine the level of significance.

DATA ANALYSIS

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Integration of AI in CRM Technology	0				
Integration of AI in CRM Technology	100	1.00	5.00	4.0100	.97954
AI-Driven Personalization in CRM	100	1.00	5.00	3.9000	1.10554
AI-Enhanced Customer Data Management	100	1.00	4.50	4.1700	.85641
AI-Enabled Automation in CRM Processes	100	1.00	5.00	4.0800	.66180
Valid N (listwise)	0				

For the data analysis of this study, descriptive statistics were used to provide a summary of the variables' characteristics. The survey involved one hundred participants, and the following statistics was computed for each variable:
When it comes to the Integration of AI in CRM Technology, the responses varied from a minimum of 1. From 00 to a maximum of 5. 00, with a mean score of 4. 0100 and standard deviation of 0. 97954. This means that, on average, the respondents had a high perception on the integration of AI in their CRM systems but with some difference.
Concerning the AI-Driven Personalization in CRM, the scores obtained ranged from a minimum of 1. 00 and a maximum of 5 points The assessment of the participants was based on the following criteria: 00. The mean score for this variable was 3. 9000, with the standard deviation of 1. 10554. This implies that although the general attitude towards personalization by AI was positive, there was a lot of variation in how the respondents experienced personalization by AI in the context of CRM systems.
Regarding AI-Enhanced Customer Data Management the responses were: 1. 00 and 4. 50, with a mean of 4. 1700 and a standard deviation of 0. 85641. This suggests that the respondents had a positive perception towards the use of AI in enhancing the management of customer data with slightly less standard deviation compared to the other variables.
Finally, the scores of the AI-Enabled Automation in CRM Processes were between 1. 00 to 5. 00, with a mean score of 4. 0800 and standard deviation of 0. 66180. This implies that the respondents saw the automation of CRM processes through AI as very effective with less variation in their response as compared to the AI based personalization.

Correlations					
		Integration of AI in CRM Technology	AI-Driven Personalization in CRM	AI-Enhanced Customer Data Management	AI-Enabled Automation in CRM Processes
Integration of AI in CRM Technology	Pearson Correlation	1	-.181	-.104	-.134
	Sig. (2-tailed)		.072	.301	.185
	N	100	100	100	100
AI-Driven Personalization in CRM	Pearson Correlation	-.181	1	-.067	-.086
	Sig. (2-tailed)	.072		.506	.397
	N	100	100	100	100
AI-Enhanced Customer Data Management	Pearson Correlation	-.104	-.067	1	-.060
	Sig. (2-tailed)	.301	.506		.554
	N	100	100	100	100
AI-Enabled Automation in CRM Processes	Pearson Correlation	-.134	-.086	-.060	1
	Sig. (2-tailed)	.185	.397	.554	
	N	100	100	100	100

The correlation analysis was conducted to explore the relationships between the integration of AI in CRM technology and the various dependent factors: The three areas that have been impacted by Artificial Intelligence are personalization, customer data management, and automation in the CRM processes. The Pearson correlation coefficients and significance levels give the information about these relationships.

Integration of AI in CRM Technology had a negative correlation with AI-Driven Personalization in CRM which was -0. 181, p <0. 072. As it can be seen in the table, the correlation is slightly negative, which indicates that as AI integration increases, the perceived level of personalization slightly decreases. However, the p-value is greater than the conventional level of 0. 05, which means that this relationship is not significant. Thus, the evidence does not provide a clear and significant support to the relationship between these variables.

In the same way, the relationship between Integration of AI in CRM Technology and AI-Enhanced Customer Data Management was negative (-0. 104, with the level of significance of 0. 301. This weak negative correlation indicates that there is only a very small level of negative relationship between the integration of AI and the efficiency of data management. The p-value greater than 0.05 shows that this relationship is not statistically significant, this means that the integration of AI does not make a significant difference in how customer data is handled.

In the case of the second research question: The correlation coefficient for Integration of AI in CRM Technology and AI-Enabled Automation in CRM Processes was -0. 134, at a significance level of 0. 185. This weak negative correlation mean that there is a very weak negative relationship between the integration of AI and the effectiveness of automation. The significance level, being above 0. 05, this means that this relationship is not significant at all.

DISCUSSION

The study aimed to investigate the impact of AI integration in CRM technology on three key aspects: AI based personalization, use of AI in customer data management, and AI integrated automation in the CRM. The analysis showed the following patterns of the relationships between these factors, which explain the impact of AI integration on CRM performance in more detail.

The hypothesis that integration of AI in CRM technology has a positive relation with AI-based personalization in CRM was not established. The integration of AI and the extent of AI personalisation was overall, even inversely related with a Pearson correlation coefficient of -0. 181 and a significance level of 0 As for the reliability of the means, the coefficient alpha was calculated to be 0. 072. This means that though there is slight negative correlation, it is not very strong or significant. This has a surprising implication that, with increased integration of artificial intelligence, the level of personalization in CRM systems is not improved. This could have been due to a variety of reasons such as, it could be that the AI tools that were used are not fully personalized or that other aspects of CRM processes could be constraining the use of these tools.

The hypothesis that the integration of AI in CRM technology enhances data on customers using AI was also not supported. The coefficient of relationship between integration of AI and customer data management was -0. 104, and at a significance level of 0. 301. A negative coefficient of 0.286 and a high p-value of 0.165 suggest that AI integration has a poor and insignificant association with the job done on customer data. This result suggests that the integration of AI may not make significant differences in the ways that customer data is collected and analyzed, which may be due to the current state of the AI solutions or the data management approaches that do not fully employ AI potentials.

Last, the hypothesis that the integration of AI in the CRM technology improves AI-enabled automation in the CRM processes was also not confirmed by the evidence. The correlation coefficient was - 0. 134, at p <0. 185. The weak negative correlation indicates that integration of AI does not enhance automation of CRM processes. This lack of statistical significance might mean that there are other factors that affect the efficiency of AI in the automation of the CRM processes, including the quality of the AI tools, the compatibility of the AI tools with the existing systems, or the degree of utilization of the AI tools for automation of the CRM processes.

The research indicates that the expected benefits of AI integration for personalization, data, and automation in CRM are not as significant as thought. The low and insignificant coeffients clearly point to the fact that more research needs to be done to understand the causes of these findings. Some possible directions for the further research are the identification of the particular AI technologies applied, the approaches to their adoption, and the correspondence of the CRM goals. Further, researching other organizational factors including training and integration of the system might give a broader perspective on how AI can improve on the performance of CRM.

CONCLUSION

The purpose of the study was to measure the effects of AI integration in CRM technology in areas like AI based personalization, customer data management using AI and AI based automation in CRM. However, as expected, the results showed that the level of AI integration was only weakly positively related and statistically insignificant with the following dependent factors. More particularly, the study indicated that AI adoption failed to improve personalization and data handling and automation in CRM systems. Based on these results, it could be inferred that current advancements in AI in CRM technology may not be optimizing on its potential to influence these areas as envisaged. The weak and negative coefficients point out some potential issues with the AI tools or their implementation within the existing CRM architectures. This suggests that there is still more research on how to enhance the utilisation of AI innovations and how they can be made to support the objectives of CRM. Further research should look at the details of the applications of AI tools, the use and adoption strategies of AI in the CRM and the impact of various organizational factors on the use of AI to improve the CRM performance. In summary, this research indicates the potential of AI in enhancing CRM systems while highlighting the need to fine-tune the AI solutions and solve the practical issues to realize the envisaged efficiency in customization, information handling, and the use of automation.

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