

HARNESSING ARTIFICIAL INTELLIGENCE FOR INNOVATIVE CUSTOMER RELATIONSHIP BUILDING: A MULTI-DIMENSIONAL ANALYSIS

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Abstract

Within the current business environment, the incorporation of Artificial Intelligence has surfaced as a paradigm-shifting phenomenon, offering prospects for novel strategies in cultivating consumer relationships. The purpose of this study is to perform a comprehensive examination that centres on the utilisation of artificial intelligence in the domain of customer relationship development. The purpose of the study is to determine the effect that A.I.-driven strategies have on the development of positive consumer relationships. Additionally, the research investigated whether the difficulties associated with A.I.-driven strategies had an impact on customers' perceptions of said strategies. The current investigation was carried out in the northern Kerala region, encompassing 362 retail firms of small and medium scale. Overall, the results indicated that A.I.-driven strategies assisted businesses in establishing positive customer relationships.

Keywords: Chatbots - Predictive Analytics - Sentimental Analysis- Dynamic Pricing - Customer Experience - Communication Effectiveness – Customer Relationship Building

Introduction

Within the rapidly evolving realm of modern business, there has been a paradigmatic change in the approach to consumer relationship development, which has been driven by technological advancements. Leading this paradigm shift is Artificial Intelligence (AI), an adaptable and ever-evolving entity that has fundamentally transformed the manner in which businesses interact with their clientele. This study aims to investigate the complexities and potential benefits of utilising AI to establish innovative consumer relationships through a multidimensional examination that reveals the interdependent nature of technology and human interaction.

In the past, the establishment of consumer relationships was predicated upon interpersonal engagements, intuition, and experience-based comprehension. Nevertheless, the advent of artificial intelligence (AI) technologies has added fresh facets to this complex interplay, presenting businesses with unparalleled prospects to comprehend, predict, and accommodate the varied requirements of their customers.

What are A.I Driven Strategies?

The implementation of Artificial Intelligence (AI)-powered strategies signifies a fundamental change in the way organisations conduct diverse facets of their activities. In the realm of operational efficiency and consumer engagement, AI technologies are being utilised to generate novel solutions and propel

organisations to triumph. Within the ever-evolving realm of contemporary commerce, Artificial Intelligence (AI) has surfaced as a disruptive entity, fundamentally altering conventional approaches and unveiling novel opportunities. The incorporation of AI-powered tactics signifies not only a technological advancement but also a paradigmatic transformation in the manner in which enterprises function, engage with clientele, and formulate strategic judgements. Customer interactions are being revolutionized by AI-powered strategies. Driven by conversational interpreting, chatbots as well as virtual assistants deliver personalized and immediate responses. By customizing recommendations, predictive analytics provides clients with a more individualized and gratifying experience. By facilitating an understanding of consumer sentiments, sentiment analysis enables organisations to cultivate more profound connections.

Impact of A.I Driven Strategies on Customer Relationship Building

The implementation of customer relationship building tactics powered by Artificial Intelligence (AI) has a pervasive effect, fundamentally altering the interplay between businesses and their clientele in a number of substantial ways. By analysing enormous quantities of customer data, AI enables businesses to gain insight into the preferences, behaviours, and purchasing histories of specific customers. This data facilitates hyper-personalization by customizing interactions, services, and products to correspond with the specific requirements and inclinations of every individual consumer. The extent to which this is tailored improves customer contentment and cultivates a more profound affective bond. Automated communication systems, chatbots, and virtual assistants that are propelled by AI deliver prompt and effective replies to inquiries from customers. Customer engagement is increased as a result of this responsiveness; routine interactions can be handled by AI, allowing human agents to concentrate on more intricate matters.

By analysing past data and client behaviour, AI algorithms forecast future requirements and preferences. Through proactive anticipation of customer needs, organisations have the ability to provide pertinent goods or amenities, thereby establishing an interaction with clients that is both seamless and foreshadowed. The ethical implementation of AI technologies enhances the level of transparency in consumer interactions. This openness instills confidence in consumers by elucidating how choices are made and guaranteeing the responsible utilisation of their data. AI-powered approaches revolutionize the process of cultivating consumer relationships through the facilitation of individualized, streamlined, and proactive exchanges. By employing AI technologies strategically, organisations can cultivate more robust and long-lasting connections with customers in the era of digitalization, through proactive problem-solving and enhanced service provision.

Review of Literature

Amit Kumar Kushwaha et.al (2021), recommended that the CX of B2B organisations utilising chatbots is affected by the overall system design of these algorithms, the technological proficiency of customers, and their confidence in the company as well as structure.

Trinh Thi Thu Huong et.al (2023), underscores the significance of chatbots in enhancing online customer happiness, which in turn motivates repeat purchases.

Qi Zhou et.al (2023), added to the body of expertise regarding the mechanisms that influence the standard of communication that users expect from chatbot applications and provide managerial insights that can be applied to chatbots and ways to communicate.

Wan-Hsiu Sunny Tsai et.al (2021), demonstrated that apparent parasocial conversations and interactions mediate the effects of chatbots' elevated social aspect conversation on client satisfaction results.

Claudio Vitari and Elisabetta Raguseo (2020), provided the proof that the business advantages of big

data analytics contributes to enhanced company efficiency, specifically in the areas of profitability, competitive advantage, and satisfaction with clients.

Heli Hallikainen et.al (2020), verified that client analytics based on big data increases the efficacy of customer relationships and the development of revenues for B2B companies.

Alison Munsch (2021), suggested that brief online promotional campaigns that incorporate humour, music, and societal influencers have a positive effect on both age groups.

Weng Marc Lim et.al (2021), discovered that the trustworthiness, layout, personalization, usability, and recreational value of online advertisements all have a positive effect on the perception of digital natives regarding internet marketing.

Prajwal Eachempati et.al (2022), suggested that investor sentiment is significantly influenced by consumer sentiment, which subsequently affects the market for shares and the value of the firm.

Amjad Iqbal et.al (2022), demonstrated the critical significance of analysis of sentiment in networking posts and customer ratings in order to gain insightful information.

Carlos de las Heras-Pedrosa et.al (2020), investigated the influence of social media on risk communication in uncertain contexts, as well as its effect on the sentiments and emotions derived from semantic analysis in Spanish society amidst the COVID-19 pandemic.

Demola Obembe et.al (2021), suggested that the opinions of tourism audiences are significantly influenced by institutional actors.

Amirreza Rohani and Mohsen Nazari (2012), indicated that customers with a high level of engagement reacted more favourably to dynamic pricing as opposed to consistent pricing.

Shukla, Milan and Malhan, Prabal (2019), discovered the impression of price equity correlates poorly with timed closeness and price distinction, i.e. Price fluctuations that occur for a brief period of time are also regarded as unjust by clients, as are significant price increases.

Chong Zhang et.al (2021), contribute to the investigation of the impact of the benchmark price on dual-channel supply chain oversight and propose a contract-based two-stage decision strategy to enhance the efficiency of supply chains.

Kelly L. Haws and William O. Bearden (2006), emphasised the possible adverse consequences that may arise from price shifts resulting from dynamic pricing strategies.

Xue-Liang Pei et.al (2020), demonstrated the correlation between consumer contentment and experience in various purchasing scenarios.

Shefali Jaiswal et.al (2020), it has been recommended that consumers base their evaluations of total web browsing experiences and satisfactions on customer services, monetary value, customization, and after buying experience.

Maja Šerić (2020), illustrated that consistency in communication had a significant direct effect on customer devotion and confidence.

Upasna A. Agarwal and Sushmita A. Narayana (2020), discovered that relational communication was closely associated with relational fulfilment, with trust serving as a partial mediator of this connection.

Statement of Problem

The incorporation of Artificial Intelligence (AI) across the establishment of consumer relationships has gained significant importance in the modern business environment, particularly for companies attempting to navigate the intricacies of the digital age. The advent of AI-powered approaches introduces a range of prospects and obstacles, which calls for a thorough analysis in order to comprehend the multifaceted facets linked to "Utilising Artificial Intelligence to Foster Innovative Customer Relationship Creation."

Research Gap

The majority of prior research was focused on the application of artificial intelligence and its strategies within the retail industry. The examination of the same's effects is necessary in order to assess its effectiveness on different components. The current body of investigation on consumer perceptions of AI-driven techniques in the retail industry is limited in scope and depth. Examining consumers' perceptions of the manner in which AI influences their purchasing experiences addresses the knowledge divide. The existing body of research primarily examines the implementation of AI by major retail chains, thereby neglecting the outcomes and obstacles encountered by small to medium-sized retailers. Gaining a comprehensive understanding of the way AI-driven tactics can be customized to accommodate the unique requirements and capabilities of lesser retail enterprises is of utmost importance.

Objectives

The current investigation sought to ascertain whether or not a correlation existed between a subset of A.I.- driven strategies. Furthermore, the inquiry seeks to examine the notable variation in customer perspectives regarding AI-powered approaches when confronted with varying degrees of difficulty in implementing and embracing such strategies. Additionally, the research endeavours to examine the impact of two intermediary variables - namely, communication effectiveness and customer experience - on the development of customer relationships. This research concludes by evaluating the overall effectiveness of AI - driven customer connection -building tactics.

Conceptual Model

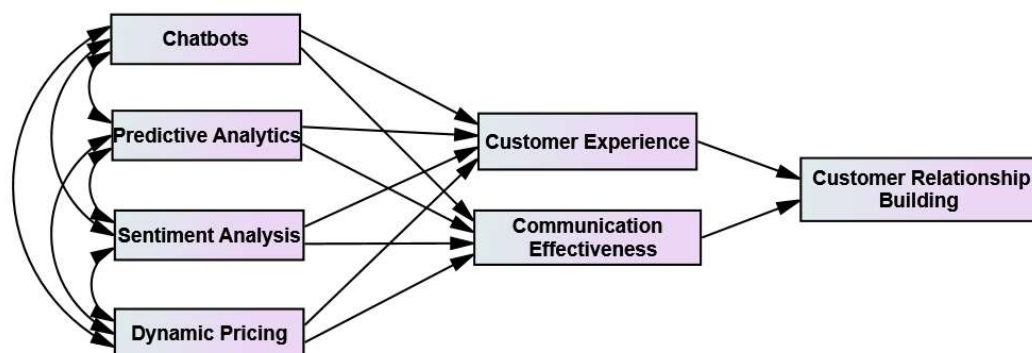


Figure 1 Conceptual Model

The aforementioned conceptual framework demonstrates the instantaneous impact that four specific AI-driven strategies have on the efficacy of communication and the experience of customers, in addition to the subsequent effect that this has on the development of customer relationships.

Hypothesis

H01: There is no significant correlation among the selected AI-driven strategies.

H02: There is no significant difference in customer perceptions towards AI-driven strategies across different levels of challenges associated with the implementation and adoption of these strategies.

H03: There is no significant linear relationship between Customer Experiences, Communication Effectiveness, and Customer Relationship Building.

H04: There is no significant direct or indirect effect of A.I. driven strategies on customer relationship building through any specified paths in the structural equation model.

Research Methodology

Both supplementary (auxiliary) and primary (fundamental) evidence provide support for the ongoing inquiry. A methodology employing an improbable purposive selection strategy has been developed to collect vital data. In order to obtain detailed information from the participants, a questionnaire deemed suitably designed was provided. The crucial information was provided by 362 small and medium-sized retail companies in the Northern Kerala region using the Cochran formula. Further means for knowledge may consist of scholarly journals, the internet, and papers, across other possibilities.

Analysis and Interpretation

The analysis of data comprises a methodical exploration, rectification, alteration, and rebuilding of information with the purpose of deriving an outcome that is applicable to a specific situation. The process by which raw data is transformed into practical information is what empowers consumers to make choices. The acquired data were analysed using statistical methods such as Reliability Test, Correlation as well as Regression Analysis, the ANOVA test, and SEM-Path Analysis.

Table 1 Reliability Statistics

Cronbach's Alpha	N of Items
.936	11

Interpretation

An exceedingly large Cronbach's Alpha value of 0.936 is regarded as such. The information presents a strong association among the parts comprising the parameter scale, thereby implying a dependable internal linearity. In summary, the substantial Cronbach's Alpha value of 0.936 indicates that the scale's components consistently evaluate the identical core conception. This promotes trust in the dependability of the evaluation apparatus.

Table 2 Correlations Analysis

Correlations					
		Chatbots	Predictive Analytics	Sentimental Analysis	Dynamic Pricing
Chatbots	Pearson Correlation	1	.532**	.425**	.475**
	Sig. (2-tailed)		.000	.000	.000
	N	362	362	362	362
Predictive Analytics	Pearson Correlation	.532**	1	.594**	.563**
	Sig. (2-tailed)	.000		.000	.000
	N	362	362	362	362
Sentimental Analysis	Pearson Correlation	.425**	.594**	1	.792**
	Sig. (2-tailed)	.000	.000		.000
	N	362	362	362	362
Dynamic Pricing	Pearson Correlation	.475**	.563**	.792**	1

	Sig. (2-tailed)	.000	.000	.000	
	N	362	362	362	362
** . Correlation is significant at the 0.01 level (2-tailed).					

Interpretation

In order to examine the initial hypothesis, which posited the presence of a connection among four specific A.I.-driven strategies, a correlation analysis was performed. Based on the analysis, it is evident that the significance value for each strategy is less than 5%. As a result, the null hypothesis that there is no correlation between strategies powered by AI was refuted. Therefore, it asserts that a positive correlation existed between the chosen strategies.

ANOVA Test

Table 3 Customer Perception - Transparency Concerns

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	92.197	4	23.049	51.332	.000
Within Groups	160.301	357	.449		
Total	252.497	361			

Table 4

Customer

Perception - Privacy Issues

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	66.250	4	16.563	31.747	.000
Within Groups	186.247	357	.522		
Total	252.497	361			

Table 5 Customer Perception - Security Risks

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	50.062	4	12.516	22.072	.000
Within Groups	202.435	357	.567		
Total	252.497	361			

Interpretation

In order to determine whether there were significant differences in customer perceptions of AI-driven strategies across the execution and acceptance of these strategies, an ANOVA test was utilised to identify such differences. In this analysis, three significant challenges were considered: transparency concerns, privacy issues, and security risks. The analysis reveals that the significance level for three of the challenges is less than 5%. As a result, the null hypothesis that there is no variation in customer views of AI-driven strategies across execution and adaptation obstacles of varying degrees was overruled. Thus, it can be concluded that the three challenges that were chosen had an impact on the perceptions of customers.

Regression Analysis**Table 6 Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.716 ^a	.513	.510	.640

a. Predictors: (Constant), Communication Effectiveness, Customer Experience

Table 7 ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	154.532	2	77.266	188.748	.000 ^b
1 Residual	146.960	359	.409		
Total	301.492	361			

a. Dependent Variable: Customer Relationship Building

b. Predictors: (Constant), Communication Effectiveness, Customer Experience

Table 8 Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.601	.200		3.007	.003
1 Customer Experience	.587	.050	.513	11.740	.000
Communication Effectiveness	.270	.040	.295	6.748	.000

a. Dependent Variable: Customer Relationship Building

Interpretation

ANOVA testing was utilised to determine the relationship between customer experience, communication effectiveness, and customer relationship development. As indicated in the model summary table, the R-squared value is 0.513. More precisely, the efficacy of communication and the customer experience influenced customer relationship development by 51.3%. It is evident from the results of the ANOVA that the regression's value of significance was below 5%; therefore, it was appropriate to continue with the coefficient check. The beta values for customer experience and communication effectiveness are 0.587 and 0.270, respectively, as shown in the coefficient tables. Both of these values are positive, and the significance level for both variables is below 5%. Accordingly, customer relationship building would increase by 0.587 and 0.270, respectively, for every one-unit increase in customer experience and communication effectiveness.

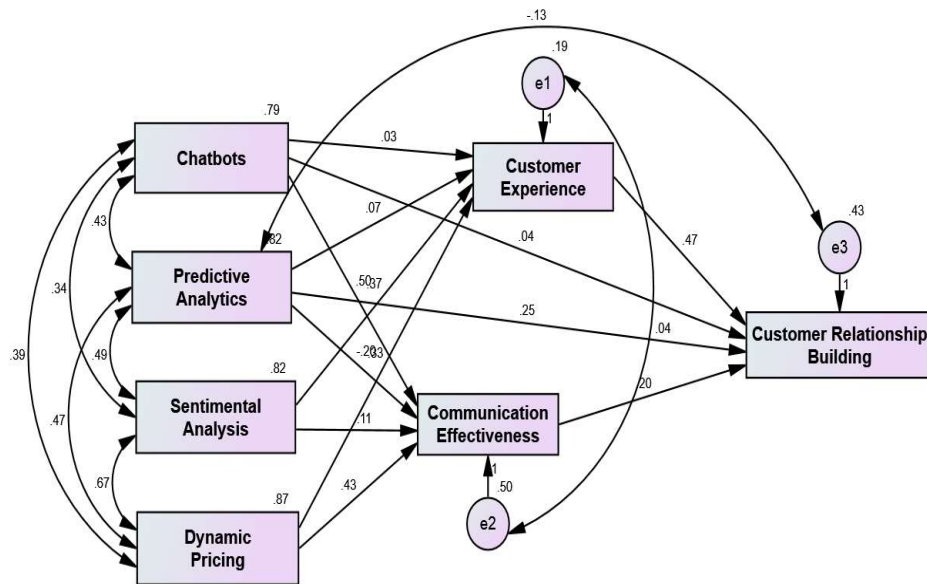


Figure 1 SEM – Path Analysis

Table 9 Model Fit Measures

MEASURE	ESTIMATE	CRITERIA	INTERPRETATION
CMIN		-	-
DF		-	-
CMIN/DF	1.437	Between 1 and 3	Model Fit
CFI	1	>0.95	Model Fit
SRMR	0.003	<0.08	Model Fit
RMSEA	0.035	<0.06	Model Fit
PClose	0.418	>0.05	Model Fit

Table 10 Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P
Communication Effectiveness	<---	Chatbots	.502	.051	9.760	***
Customer Experience	<---	Chatbots	.034	.032	1.081	.280
Customer Experience	<---	Predictive Analytics	.066	.035	1.908	.056
Communication Effectiveness	<---	Predictive Analytics	-.202	.056	-3.615	***
Customer Experience	<---	Sentimental Analysis	.370	.044	8.394	***
Communication Effectiveness	<---	Sentimental Analysis	.111	.071	1.558	.119
Communication Effectiveness	<---	Dynamic Pricing	.434	.068	6.371	***
Customer Experience	<---	Dynamic Pricing	.335	.042	7.930	***
Customer Relationship Building	<---	Customer Experience	.473	.074	6.377	***
Customer Relationship Building	<---	Communication	.197	.046	4.292	***

				Estimate	S.E.	C.R.	P
Building Customer Building	Relationship	<--- Chatbots	Effectiveness	.039	.071	.552	.581
Building Customer Building	Relationship	<--- Predictive Analytics		.246	.144	1.709	.088

Table 11 Covariances: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P
Chatbots	<-->	Dynamic Pricing	.393	.048	8.152	***
Predictive Analytics	<-->	Dynamic Pricing	.468	.050	9.275	***
Sentimental Analysis	<-->	Dynamic Pricing	.667	.057	11.798	***
Chatbots	<-->	Sentimental Analysis	.341	.046	7.432	***
Predictive Analytics	<-->	Sentimental Analysis	.487	.050	9.733	***
Chatbots	<-->	Predictive Analytics	.427	.048	8.926	***
e1	<-->	e2	.036	.017	2.190	.029
e3	<-->	Predictive Analytics	-.127	.068	-1.882	.060

Table 12 Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P
Chatbots	.789	.059	13.435	***
Predictive Analytics	.816	.061	13.435	***
Sentimental Analysis	.818	.061	13.435	***
Dynamic Pricing	.867	.065	13.435	***
e1	.193	.014	13.435	***
e2	.504	.038	13.435	***
e3	.430	.048	8.908	***

Interpretation

In order to assess the overall effectiveness of AI-driven strategies in fostering customer relationships, path analysis is performed. The model fit table reveals that the CFI is flawless (1), indicating a very good fit, and that the CMIN/DF ratio ranges from 1 and 3, signalling a suitable fit. A close alignment is indicated by the extremely low SRMR (0.003) and acceptable RMSEA (0.035). In conclusion, the PClose value indicates a satisfactory alignment. In aggregate, the aforementioned metrics indicated that the structural equation model adequately represents the data.

As the coefficient for regression is 0.502, there is a positive correlation between the utilisation of chatbots and the effectiveness of communication. The estimate demonstrates statistical significance with a critical ratio (C.R.) of 9.760, as indicated by the *** ($p < 0.001$). Furthermore, the regression weight of -0.202 suggests a negative relationship between Predictive Analytics and Communication Effectiveness. At -3.615 C.R., the estimate is statistically significant ($p < 0.001$). The regression weight is 0.370, and the correlation between Sentimental Analysis and Customer Experience is positive and statistically significant (C.R. = 8.394, $p < 0.001$). The regression weight in this case is 0.370. In a similar vein The regression weight of 0.434 suggests that the relationship between Dynamic Pricing and Communication Effectiveness is both positive and statistically significant (C.R. = 6.371, $p < 0.001$). A statistically significant and positive correlation (C.R. = 7.930, $p < 0.001$) is observed between dynamic

pricing and customer experience; the regression weight for this relationship is 0.335. Also Customer Experience and Customer Relationship Building have a positive and statistically significant relationship (C.R. = 6.377, p 0.001), as indicated by the regression weight of 0.473. In conclusion, the regression weight of 0.197 signifies that the relationship between Customer Relationship Building and Communication Effectiveness is both positive and statistically significant (C.R. = 4.292, p 0.001). The significance of the relationship between dynamic pricing and sentiment analysis, predictive analytics, and chatbots is demonstrated in the covariance table. Likewise, there was a significant correlation between sentiment analysis and both predictive analytics and chatbots. The correlation between chatbots and predictive analytics was also substantial. All of these associations were deemed significant due to the fact that the P values were below the 5% significance level. It was clear from the variance table that the variances of all of the tactics are statistically significant.

Findings

The intent of the research was to determine how AI-driven strategies affected customer relationship development. It was evident by the conclusion of the study that the four A.I.-driven strategies that were selected exhibited a strong correlation with one another. It was demonstrated through correlation analysis. Additionally, according to the study, the challenges linked to these strategies had an impact on consumer perception. It was determined through regression analysis that customer relationship building was positively influenced by both communication efficacy and customer experience. The evaluation of the chosen strategies' overall effectiveness in fostering customer relationships was conducted employing SEM-path analysis.

Suggestions

Organisations may employ AI algorithms to scrutinize consumer data and behaviour with the intention of delivering tailored product recommendations. Furthermore, recommendation engines that propose pertinent products in accordance with previous purchases, perusing history, and personal preferences can be implemented. Organisations are urged to incorporate avatars enabled by artificial intelligence (AI) into their websites and social media platforms in order to deliver immediate consumer assistance. Organisations ought to employ AI algorithms to execute dynamic pricing strategies that are predicated on customer behaviour, competitor pricing, and demand. Protect the business and its patrons by identifying and preventing fraudulent activities using machine learning models.

Scope for the Future Study

This research paper conducts an extensive analysis of the intricate relationship that exists among communication efficacy, consumer experience, and artificial intelligence (A.I.) strategies. The primary objective of this research is to examine the various complex aspects of AI-driven initiatives, such as sentiment analysis, chatbots, and personalized recommendations, and their direct impact on the consumer experience as a whole. This study will investigate the impact of A.I. technologies on the efficacy of communication, focusing on critical factors including lucidity, responsiveness, and consumer perceptions. The study aims to elucidate the processes by which A.I. strategies facilitate the development and sustenance of strong customer relationships by directing attention towards ethical considerations, long-term results, and industry-specific intricacies. By utilising a combination of both research approaches—insofar as data analytics, interviews, and surveys—the study endeavours to furnish all-encompassing perspectives on the most effective incorporation of artificial intelligence (A.I.) in customer relationship development. In doing so, it intends to furnish pragmatic suggestions for enterprises endeavoring to traverse this dynamic terrain.

Limitation

The present inquiry was limited in breadth to the small and medium sized retail firms. The participants of the research are solely inhabitants of the regions of Northern Kerala. Time limitations represent a substantial constraint on the scope of this study. A limited range of statistical methods, such as correlation, regression, ANOVA, and path analysis, were employed in the investigations.

Conclusion

In summary, the research sheds light on the critical significance of artificial intelligence in influencing modern consumer relationships. The results emphasize the significant impact that artificial intelligence (AI) tactics, including chatbots, dynamic pricing, sentiment analysis, and others, have on improving consumer experiences and enhancing the efficacy of communication. In addition to facilitating the streamlining of interactions, the incorporation of A.I. technologies fosters the development of relationships that are more individualized, responsive, and founded on trust. Furthermore, the study demonstrates that the challenges associated with these strategies have an impact on consumer perception. With the growing adoption of artificial intelligence (A.I.) by businesses, the knowledge gained from this study offers valuable direction, allowing organisations to strategically utilise A.I. to cultivate long-lasting consumer relationships. Additionally, the research examines the impact of communication effectiveness and consumer experience on the development of customer relationships. In its entirety, the study enhances comprehension regarding the potential of artificial intelligence (A.I.) to strengthen customer relationships, thereby facilitating the development of a business environment that is more customer-focused and technologically advanced.

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