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A Study On The Impact Of Ai-Driven Personalized Recommendations On Consumer Behaviour In Online Purchases

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ABSTRACT
Technology has been influencing mankind since decades in terms of the way they live their lives. One such technology that brought the world on our fingertips is e-commerce. Today, the world has become so dynamic that people can literally purchase anything online, anywhere, anytime. The retail sector is changing rapidly with the use of newer technologies and one such technology is Artificial Intelligence (AI) which is transforming the online purchase experience and shaping consumer behaviour. This research aims to study the impact of AI-driven personalized recommendations on consumer behaviour and their engagement with reference to online purchases. It also attempts to explore the awareness and satisfaction of consumers with these recommendations.

Key Words: Artificial Intelligence, AI, Online Purchase, E-Commerce

INTRODUCTION

We live in a technology-driven world and everything we do in our lives is influenced by technology, let alone the business world. Technology is changing the perception of marketing departments from being one of the major functions of business to being strategic partners of the business who make effective decisions for providing competitive edge to the business. This is done by processing large amounts of real-time data to provide a seamless customer experience. *E-Commerce* has been the buzz word since quite some time and technology is the catalyst for taking E-Commerce to newer heights.

The world of E-Commerce has become highly dynamic wherein the digital marketplace is growing drastically. Newer technologies like Artificial Intelligence (AI) have revolutionized the way in which customers shop from online retailers. With the exponential growth of concepts such as big data, machine learning and neural networks, Artificial Intelligence has become a vital part in the strategic planning of various companies around the world. Companies are increasingly channelizing their resources towards the utilization of AI to gather more information about consumer behaviour and make more sense of the data available to them. Reaching out to new customers, automation of routine tasks, experimenting with new products and services, developing advertising content and enhancing customer service are only a few ways in which AI is changing the future of marketing.

Among all these advancements brought on by AI, personalized recommendations have completely changed the shopping experience of customers, especially online. Machine Learning algorithms and big data analytics coupled with AI-generated personalization are being employed to enhance customer engagement and also drive sales. This research paper seeks to study the impact of these personalized recommendations on consumer behaviour.

RESEARCH OBJECTIVES

The objectives of this research paper are:

- To study the impact of AI-driven personalized recommendations on consumer behaviour in online purchases.
- To examine the factors that impact the effectiveness of personalized recommendations
- To identify the challenges and limitations associated with AI-driven recommendations for online selling.

LITERATURE REVIEW

One of the most fundamental strategies that is becoming more instrumental in enhancing customer experience and also driving online sales is personalization. With the increasingly competitive online marketplace, consumers are being showered with choices and it has become the biggest challenge for online retail players to maintain customer loyalty. The answer to this has come in the form of personalized recommendations with the use of AI algorithms and data analytics which deliver tailored product suggestions based on individual preferences, browsing history, purchase behaviour, and

demographic information *(Kannan & Li, 2017)*. Artificial Intelligence can help strategize to win repeat customers and can provide the marketers with accurate target customer groups and improve the quality of customer service *(Yang, Ni & Li, 2021)*. Successful companies like Amazon, Domino's, Macy's many such brands are incorporating Artificial Intelligence to enhance their brand image and also experiment with new products and services *(Huang & Rust, 2020)*.
Machine Learning algorithms are used to analyse large amounts of data and generate personalized recommendations on a real-time basis *(Abrahams, 2017)*. Filtering techniques such as collaborative and content-based filtering identify patterns and similarities amongst different user groups *(Su & Khoshgoftaar, 2009)*. Also, item attributes and user profiles are matched to recommended items similar to the items previously liked or purchased by the user *(Pazzani & Billsus, 2007)*. These advances in artificial intelligence have enhances the relationship between marketers and consumers by accurately identifying customer needs. This provides better development for precision marketing *(Yang & Li, 2021)*.
Recently, AI-powered Chatbots are changing the customer service experience by interacting with customers in real-time. Predictive analytics is helping optimise business processes and increase revenue by reducing costs *(Lakshmipriyanka, Harihararao, Prasanna & Deepika, 2023)*. It is becoming increasingly important for businesses to compete in this virtual and digital environment and embrace digital transformation to sustain in this highly competitive business environment *(Nalbant & Aydin, 2023)*. AI is drastically changing the face of marketing like never before by making it more predictive and personalized and has become an inevitable part of the future of marketing and sales *(Sumitha, 2022)*.

RESEARCH METHODOLOGY

This research employs a quantitative approach to gather data from respondents through a structured questionnaire on Google Forms. Convenient sampling method was used to collect data through various channels such as social media, email and online communities. Responses were received from 210 respondents.

LIMITATIONS OF THE STUDY

- The study may be subject to bias as it relies on self-reported data.
- Generalizing the findings may not be accurate for the larger population due to the convenience sampling.
- The study may not cover all factors influencing consumer behaviour and engagement with online purchases.

DATA ANALYSIS AND FINDINGS

Descriptive statistics was used to analyse the demographic characteristics of the respondents and their online shopping behaviour. Chi-square, ANOVA and Correlation analysis has been used to interpret the relation between different variables in the study.

Descriptive Statistics Age:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24	96	45.7	45.7	45.7
	25-34	24	11.4	11.4	57.1
	35-44	75	35.7	35.7	92.9
	45-54	15	7.1	7.1	100.0
	Total	210	100.0	100.0	

Gender:

		Frequency	Percent	Valid Percent	Cumulative
Valid	Male	105	50.0	50.0	50.0
	Female	105	50.0	50.0	100.0
	Total	210	100.0	100.0	

Education:

		Frequency	Percent	Valid Percent	Cumulative
Valid	12th	45	21.4	21.4	21.4
	Graduate	96	45.7	45.7	67.1
	Post-Graduate and higher	69	32.9	32.9	100.0
	Total	210	100.0	100.0	

Do personalized recommendations save time?

		Frequency	Percent	Valid Percent	Cumulative
Valid	Strongly Disagree	12	5.7	5.7	5.7
	Disagree	27	12.9	12.9	18.6
	Neutral	57	27.1	27.1	45.7
	Agree	75	35.7	35.7	81.4
	Strongly Agree	39	18.6	18.6	100.0
	Total	210	100.0	100.0	

Importance of personalized recommendations for purchase decision:

		Frequency	Percent	Valid Percent	Cumulative
Valid	Not important at all	6	2.9	2.9	2.9
	Not important	21	10.0	10.0	12.9
	Neutral	93	44.3	44.3	57.1
	Important	72	34.3	34.3	91.4
	Very important	18	8.6	8.6	100.0
	Total	210	100.0	100.0	

Do personalized recommendations enhance overall shopping experience?

		Frequency	Percent	Valid Percent	Cumulative
Valid	Yes	156	74.3	74.3	74.3
	No	54	25.7	25.7	100.0
	Total	210	100.0	100.0	

Variable Analysis

Hypothesis 1: *There is a significant relationship between gender and the likelihood to purchase based only on personalized recommendations.*

Gender * PRBasedPurchase Cross tabulation

			PRBasedPurchas		
			Yes	No	Total
Gender	Male	Count	75	30	105
		% within	59.5%	35.7%	50.0%
	Female	Count	51	54	105
		% within	40.5%	64.3%	50.0%

Total	Count	126	84	210
	% within PRBasedPurchase	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	11.429[a]	1	.001		
Continuity Correction[b]	10.496	1	.001		
Likelihood Ratio	11.553	1	.001		
Fisher's Exact Test				.001	.001
Linear-by-Linear	11.374	1	.001		
N of Valid Cases	210				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 42.00.
b. Computed only for a 2x2 table

There is a significant relationship between gender and the likelihood to purchase based only on personalized recommendations, χ^2 (1, N=210) = 11.43, p = .001. Men were more likely to make a purchase based only on a personalized recommendation then women (59.5% to 40.5%).

Hypothesis 2: Age group influences the satisfaction level with personalized recommendations

ANOVA
SatisfiedPR

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.455	3	.485	.587	.624
Within Groups	170.145	206	.826		
Total	171.600	2099			

Based on the significance value derived, p= 0.624 (>0.05), we can conclude that age group does not appear to have a significant influence on the satisfaction levels related to personalized recommendations.

Hypothesis 3: *The time spent browsing online shopping platforms is positively correlated with the likelihood to click on personalized recommendations.*

Correlations

		TimeSpent	ClickPR
TimeSpent	Pearson Correlation	1	.324**
	Sig. (2-tailed)		.000
	N	210	210
ClickPR	Pearson Correlation	.324**	1
	Sig. (2-tailed)	.000	
	N	210	210

**. Correlation is significant at the 0.01 level (2-tailed).

The p-value derived through analysis is 0.324 (>0.05), indicating that there is no statistically significant correlation between the time spent browsing online shopping platforms and the likelihood to click on personalized recommendations. This suggests that, based on the current data, the time spent browsing does not significantly influence engagement with personalized recommendations.

Hypothesis 4: *There is a significant relationship between the awareness of personalized recommendations and the satisfaction with the transparency of personalized recommendations.*

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	50.530[a]	4	.000
Likelihood Ratio	61.026	4	.000
Linear-by-Linear Association	39.704	1	.000
N of Valid Cases	210		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.40.

The result of the analysis derives a p-value of 0.000 which is less than 0.001 which indicates that there is a significant relationship between the awareness of personalized recommendations and the satisfaction levels related to their transparency. For instance, 100% of the respondents who were aware of personalized recommendations were very satisfied.

CONCLUSION

This research paper aims to study the impact of AI-driven personalized recommendations on consumer behaviour. It also throws light on how technology can be used to drive consumer behaviour towards increased sales. As per the analysis in the research, there is a relationship between gender and likelihood to purchase, and so, AI should be modified to provide gender- specific product recommendations. The accuracy of personalized recommendations must be improved by emphasizing on browsing history and consumer preferences. Strategies should be implemented to increase awareness and transparent recommendations to build trust and loyalty. Feedback could be taken on a continuous basis to ensure that personalized recommendations is relevant to the need of the consumers. Also, ethical considerations and data privacy are crucial in order to maintain trust.

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