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Impact of artificial intelligence on consumer buying behaviors: Study about the online retail purchase

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***Abstract*---**Artificial Intelligence (AI) is an area that is fast growing in the business world. It has already been applied in many areas for instance commerce and everyday life. With AI in business, the industry will rely on faster cheaper, and more accurate marketing techniques. The present investigation is undertaken to find the relation between AI and consumer buying behavior and secondly to know the difference between customer buying behavior based on their demographics. To achieve these objectives, the researcher has collected data from 314 respondents from Nagpur. The researcher has employed Descriptive statistics, Correlation, Cronbach alpha, Anova, Mann-Whitney Test, and Kruskal-Wallis Test and has utilized SPSS for these tests. Results concluded to have a significant relationship between AI and consumer buying behavior. It was also concluded that there is a difference between consumer buying behavior and gender & monthly income. These were supported with hypothesis testing.

***Keywords*---**artificial intelligence, buying behavior, consumer, gender, income, retail.

Introduction

Increasing the use of Artificial Intelligence (AI) technology will enable businesses to deal with large amounts of data in real-time. AI can use technologies such as natural language processing, genetic algorithms, and deep learning to train machines to recognize patterns from large amounts of data. AI includes systems that think reasonably and resemble humans (Putica, 2018). AI can be well-defined as a technology that has the ability to perform tasks that require intelligence to perform when performed by humans (Mccarthy et. al., 1955). Introducing AI into various marketing processes opens up ample openings for marketers & raises interest among practitioners in their different applications (Fagella, 2018). Therefore, marketing scientists are also developing more and more research in this area (Van, et. al., 2017).

In a fast-growing retail environment, retailers need to see what and how they are doing it, and how they are making their goods. The purchasing complex uses technology, to become smarter, provide satisfaction to customers, better responses and services to customer needs, and deliver to compete in the age of AI & big data (Bertacchini, Bilotta, and Pantano, 2017). Purchases from retailers include different data types in the form of transaction data, environment data, and customer data (Grewal, Motyka, and Levy, 2018). Management of data is one of the major problems and a new area in the retail trade. In order to solve this problem, companies used innovative and dependable algorithms of data mining to store and evaluate results and improve the data performance analysis (Verma and Singh, 2018, Darbandi, 2018).

By 2030, Artificial Intelligence is expected to contribute 15 trillion-dollar to the world economy (PwC, 2017). Therefore, AI has become the most emerging trend in diverse fields including marketing. AI is revolutionizing the way consumers interact with businesses. Therefore, marketers need to be prepared for the changes that are taking place in the age of artificial intelligence. A comprehensive examination of the impact of AI on consumer behavior is still inadequate, preventing marketers from adopting such technologies. Marketers can use AI in marketing activities and features to forecast & change consumer behavior, from info retrieval, need identification, evaluation, & purchase decisions to post-buying behavior. Therefore, a gap was identified as to how does AI affect consumer purchase behavior in the context of online retail?

Study Objectives

- To find the relation between AI and consumer buying behavior.
- To know the difference between customers buying behavior based on their demographics.

Study Hypothesis

- H_1: There exists a relationship between AI and customer buying behavior.
- H_2: There is no significant difference between customer buying behavior based on their demographics (Gender and Annual Income).

Literature Review

Artificial Intelligence is a new trend in science, medicine, education, business, and the automotive industry. Now it has reached the marketing also (Jarek and Mazurek, 2019). The fast development of AI provides exciting opportunities for marketing and research (Mustak et. al, 2021)

Artificial Intelligence

The motive of Artificial Intelligence in marketing is to anticipate the next buying decision & improve the journey of customers. The core component of AI is big data, powerful resolution, and machine learning (Dimitrieska, 2018). AI understands humans' intelligence and tries to build intelligent units (Russell and Norvig, 2016). Data intelligence plays an important role in AI systems because it

processes a large amount of data. These intelligent systems review the data based on analysis and request (Verma, 2021)

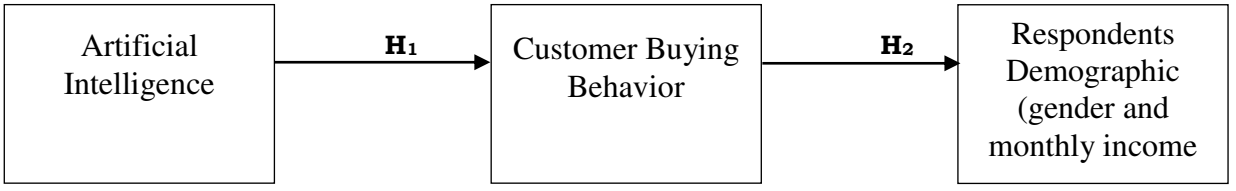
Artificial Intelligence and Online Retail Marketing

"Marketing is the management process responsible for identifying, anticipating, and satisfying customer requirements profitably", Baker, 2016. AI has gained importance in marketing by enhancing computing power and reducing costs, the obtainability of big data in the market, and the use of advanced machine learning models and algorithms (Huang and Rust, 2021). Davenport et. al., (2020) have discovered that marketing through the combination of artificial intelligence will grow significantly. AI can be used for marketing to drive business growth and improve customer satisfaction (Yaba, Ahmed, and Hamad, 2021, Khan, 2010). It also has a great potential to increase sales and increase corporate profits (Rust, 2020). Natural Language Processing with AI-driven chatbots has helped most marketing organizations and customers solve problems and generate frequent customer inquiries through these chatbots (Chatterjee et. al., 2019). Online and offline retailers are faced with constant changes in customer behavior. Therefore, it must be kept up to date by providing customers with a cheaper alternative to e-commerce with lower management costs (Bertacchini, Bilotta, and Pantano, 2017).

Artificial Intelligence and Consumer Behavior

Consumer buying is the process of decision-making to meet all the needs (Jalal, 2020, Qazzafi, 2019). Consumer purchase decision making consists of 5 steps viz., need identification, searching for information, evaluating alternatives, making a buying decision, and post-buying behavior (Kotler, 2017). Recognizing clients' preferences is one of the most common applications of AI (Muthuveloo & Ping, 2014). The supply of consumer data continues to grow in quantity, diversity, speed, and accuracy. AI helps transform this flow of data into meaningful consumer insights (Kietzmann, Paschen, and Treen, 2018). Insights into consumer buying behavior are the foundation on which marketers rely to determine marketing tactics and forecast sales. AI relies on such insights to provide retailers with product presentation and cataloging recommendations (Avinash and Jayan, 2018). Therefore, it is very vital to recognize the consumer journey. Artificial Intelligence helps marketers, and reach consumers at many stages of their journey (Kietzmann, 2018).

Research Framework



Methodology

Research Type: This study makes use of descriptive research. It is because it will describe the characteristics of the variables used.
Time and Place of Research work: This research work was undertaken in Jan. 2022. And the place of research work was Nagpur city.
Sampling Technique: This work has used convenient sampling. This method is a kind of non-probability sampling method in which samples are taken from a portion near the population
Sample Unit and Sample Size: The sample unit was the customers who purchased products online. The questionnaire was distributed to 350 customers have purchased products online during the month of February. Out of these 350 customers, 314 customers have provided full details of their purchase. Thus, making the sample size 314.

Data Collection

The questionnaire was utilized for data collection from the users purchasing online. The questionnaire was divided into 2 parts (Part A and B). Part A consist of demographic information and Part B consist of core question related to AI and consumer buying behavior.

Primary Data: This data was collected online using a structured questionnaire. 5-point Likert scale questions were used to design the questionnaire. 10 items and 8 items representing AI and consumer buying behavior respectively were used.
Secondary Data: This data was collected from websites, books, magazines, etc.
Statistical Package: SPSS software (version 24) was used to draw meaningful results
Tools Applied: Descriptive statistics, correlation, Cronbach alpha, Anova, Mann-Whitney Test, & Kruskal-Wallis test were used.

Results and Discussion

Part A: Demographic Analysis
This part consists of information about the respondents about their demographic characteristics.

Table 1: Demography of the Respondents

		Frequency	Percentage (%)
Gender	Male	136	43.31
	Female	178	56.69
Age	15 – 20	32	10.19
	21 – 25	91	28.99
	26 – 30	76	24.20
	31 – 35	51	16.24
	Above 36	64	20.38
Education	X or XII	30	9.55
	Graduate	145	46.18

	Post Graduate	97	30.89
	More than PG	42	13.38
Occupation	Homemaker	87	27.71
	Private Work	72	22.93
	Government Employee	53	16.88
	Business	69	21.97
	Other	33	10.51
Marital Status	Married	249	79.3
	Unmarried	51	16.24
	Other	14	4.46
Monthly Income	Less than 25000	71	22.61
	25001 to 35000	107	34.08
	35001 to 45000	89	28.34
	Above 45001	47	14.97
Total		314	100

Source: Survey Result

Part B: Analysis of AI and Consumer buying Behavior
This part consists of analysis to derive a conclusion keeping in mind the objectives of this research work.

Table 2: Reliability Test

Sr. No.	Construct	Cronbach's alpha	No. of items
1.	Artificial Intelligence	0.973	10
2.	Consumer Buying Behavior	0.896	8

Source: Output of SPSS
AI and consumer buying behavior are having coefficients of 0.973 and 0.896 respectively which indicates high reliability. The survey is reliable because the value of the coefficient obtained is more than 0.5 indicating good reliability and internal consistency.

Table 3: Correlation Analysis

	AI	Behavior of Consumer
AI	1	0.797**
Sig. (2-tailed)		.000
Behavior of Consumer	0.797**	1
Sig. (2-tailed)	.000	

Source: Output of SPSS
Note: ** Correlation is significant at 0.01 level (2-tailed)

Table 2 depicts about correlation matrix. The table above has two variables viz., AI and consumer behavior. It is evident that AI and consumer behavior have a positive relationship with each other. Also, there exists a significant relationship between all constructs at the 0.01 level.

Regression Analysis

Hypothesis Testing

H_1: There exists a relationship between AI and customer buying behavior
To validate the testing of H_1, a simple regression model was constructed between the dependent variable i.e., consumer behavior, and the independent variable i.e., AI.

Table 4: Anova

Model	Sum of Squares	Df	Mean Square	F	Sig
Regression	285.593	1	291.64	8819.09	.000[a]
Residual	12.715	381	.034		
Total	298.308	382			

Source: Output of SPSS

The table above reveals the outcome of the Analysis of regression between the dependent variable (consumer behavior) and independent variable (AI). Calculated F-value shows that when the results were compared to F-tabulated was significant: $F(1/381) = 8819.09$, $p<.005$, which directly implies that AI (independent variable) was a significant variable that affects the consumer behavior (dependent variable). Hence, we can conclude to accept the null hypothesis that a strong relationship exists between AI and customer buying behavior.

Table 5: Simple Regression

Model	Unstandardized Coefficients		Unstandardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constants)	.103	.039		2.533	.011
AI	.959	.011	.982	93.419	.000

Source: Output of SPSS

The table above shows the results of simple regression, which confirms the result of Anova with AI being significant, $t(2.533) = 93.419$, $p<.05$. The coefficient of determination was .961, meaning that the effect of AI is 96.1% in the distinction of consumer behavior.

H_2: There is no significant difference between customer buying behavior and based on their demographics (Gender and Annual Income).

For testing the validity of H_2, the Mann-Whitney test for gender and the Kruskal-Wallis test for annual income were undertaken.

Table 6: Mann-Whitney Test for consumer buying behavior in accordance to gender

Variable	Gender		Mann-Whitney U	Wilcoxon W	Z	Sig*
	Male	Female				
	Mean rank					
Consumers buying behavior	133.1	263.9	5589	27298	-11.81	.000

Source: Output of SPSS

The value of sig obtained is.000 which is less than 0.05 giving evidence to discard the null hypothesis & take the alternative hypothesis i.e., there is a difference between customer buying behavior & gender

Table 7: Kruskal-Wallis Test for customer buying behavior according to their income

Variable	Monthly Income				(Chi-Square)	Df	Sig*
	Less than 25000	25001 to 35000	35001 to 45000	45001 and above			
	Mean Rank						
Customers buying behavior	151.7	189.9	287.67	174.79	112.89	2	.000

Source: Output of SPSS

The value of sig obtained is.000 which is less than 0.05 giving evidence to discard the null hypothesis and take the alternative hypothesis i.e., there is a significant difference between customer buying behavior and their monthly income.

Conclusion

The purpose of this article was to find the relation between AI and consumer buying behavior and secondly to find the difference between customer buying behavior on their demographics (especially gender and monthly income). It is evident from the data analysis to have a relation between AI and consumer buying behavior. Consumers do take into consideration the recommendations made by the AI. 96.1% of customer buying behavior is due to AI. 3.9% may be due to other aspects which were not discussed in the examination. On the other hand, a significant difference was found between customer buying behavior and gender, and their monthly income. From this, it is concluded that males and females behave differently while purchasing online and their monthly income does affect their purchase decisions.

References

Avinash. M., R. Jayan, (2018). Artificial Intelligence-The marketing game changer. *International Journal of Pure and Applied Mathematic*s, 119(17), Pp. 1881-1890.

Baker, M. J. & Hart, S. (2016). The Marketing Book, Fifth Edition, Routledge, London.

Bertacchini F., Bilotta E., Pantano P. (2017). Shopping with a robotic companion. *Computers in human behavior*, 77, Pg 382-395. Available: 10.1016/j.chb.2017.02.064.

Bilal R. (2020). Is Fair Value Accounting Information Relevant and Reliable? Evidence From Capital and Debt Market Institutions in Jordan. Accessed from http://library.neu.edu.tr/cgi-bin/koha/opac-detail.pl?bib=294834

Chatterjee, S., Ghosh, S. K., Chaudhuri, R. &Nguyen, B. (2019). Are CRM systems ready for AI integration? A conceptual framework of organizational readiness for effective AI-CRM integration. The Bottom Line.

Darbandi, H. (2018). The ability of management in developing tourism destination performance in Iraqi Kurdistan. Qalaai Zanist Scientific Journal, 3 (3).

Davenport, T., Guha, A., Grewal, D. & Bressgott, T. (2020). How artificial intelligence will change the future of marketing. *Journal of the Academy of Marketing Science*, 48, Pg 24-42.

Dimitrieska, S., Stankovska, A. & Efremova, T. (2018). Artificial intelligence and marketing. *Entrepreneurship*, 6, Pg 298-304.

Fagella, D. (2018). Artificial intelligence in marketing and advertising – 5 examples of real traction [Online]. https://www.techemergence.com/artificial-intelligence-in marketing-and-advertising-5-examples-of-real-traction/. Accessed January 2022

Grewal D., Motyka S., Levy M. (2018) The Evolution and future of Retailing and Retailing Education. *Journal of Marketing Education*, 40(1), Pg 85-93.

Huang, M.-H. & Rust, R. T. 2021. A strategic framework for artificial intelligence in marketing. *Journal of the Academy of Marketing Science*, 49, Pg 30-50.

Jalal S. (2020). The Role of Management Accounting in The Decision-Making Process. Accessed from http://library.neu.edu.tr/cgi-bin/koha/opac-detail.pl?bib=294185

Jarek, K. & Mazurek, G. 2019. Marketing and Artificial Intelligence. *Central European Business Review*, 8.

Khan S. I (2010). Role of Entrepreneur in 21st Century in Economic Growth and Development, *Research Journal*.

Khan S. I., & Zada R. (2019). Factor Influencing Consumers on Beguiling Craze of Online Shopping: A Study of Attitude in Nagpur City of Maharashtra (India). *Restaurant Business*, 118(11), Pg 137-145.

Kietzmann, J., Paschen, J., and Treen, E. (2018), "Artificial intelligence in advertising: How marketers can leverage artificial intelligence along the customer journey", Journal of Advertising Research, 58(3), 263-267.

Kotler, P. (2017), Principles of Marketing, Pearson Education, Seventh European Edition.

McCarthy, J., Minsky, M. L., Rochester, N., & Shannon, C. E. (1955). A proposal for the Dartmouth summer research project on artificial intelligence [Online]. http://www -formal.stanford.edu/jmc/history/dartmouth/dartmouth.html. Accessed January 2022.

Mustak, M., Salminen, J., Plé, L. & Wirtz, J. (2021). Artificial intelligence in marketing: Topic modeling, scientometric analysis, and research agenda. *Journal of Business Research*, 124, Pg 389-404.

Muthuveloo R. and Ping T. A. (2014). SWIM: Futuristic Framework for Strategic management Process. *American Journal of Applied Sciences,* 11 (9): 1703-1713,

Putica, M. (2018). Umjetna inteligencija: dvojbe suvremenoga razvoja. Hum: časopis Filozofskog fakulteta Sveučilišta u Mostaru, 13(20), Pg 198-213.

PwC (2017), "Sizing the Prize: What's the Real Value of AI for Your Business and How Can You Capitalise?", London: PwC.

Qazzafi, S. (2019). Consumer Buying Decision Process Toward Products. *International Journal of Scientific Research and Engineering Development*, 2(5), Pp. 130 – 134.

Russell, S. J. & Norvig, P. (2016). Artificial intelligence: a modern approach. Malaysia. Pearson Education Limited London, UK:

Rust, R. T. (2020). The future of marketing. *International Journal of Research in Marketing*, 37, Pg 15-26.

Van D. J., Mende M. N., Noble S. M., Hulland J. O., Grewal D. and Peterson J. A., (2017). Domo Arigato Mr. Roboto: Emergence of automated social presence in organizational frontlines and customers' service experiences. *Journal of service research*, 20(1), Pg 43-58.

Verma N., and Singh J. (2017). A comprehensive review from sequential association computing to Hadoop-Map Reduce parallel computing in a retail scenario. *Journal of Management Analytics*, 4(4), Pg 359-392.Available: 10.1080/23270012.2017.1373261

Verma, S., Sharma, R., Deb, S. & Maitra, D. (2021). Artificial intelligence in marketing: Systematic review and future research direction. *International Journal of Information Management* Data Insights,100002

Yaba T. K., Ahmed A. K., and Hamad K. Q. (2021). COVID-19'S Impact on Brand, Campaigning and Marketing Creativity: A Social Marketing Theoretical Approach, 6(4), Pg 944-954.