

**Consumer Perception towards Artificial Intelligence in E-Commerce With Reference to
Chennai City, India**

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Abstract

In the modern era, people are much closer to technology and peoples mind are expecting new and innovative things which make their works easier and save time. Artificial Intelligence (AI) is one among those technologies which helps almost in all areas of individual's routine life. AI is the simulation of human intelligence process by machines, especially computer systems. The main aim of the study is to identify the consumer preferences towards the applications of AI in different areas of e-commerce. The research was carried out with 100 respondents and the sampling tools used were Factor analysis and Regression Analysis. The sampling method used for the study is simple random sampling. The concluding observations are that there is no relationship between usage and recompenses factors while there is significant relationship between the techniques factors. The most influencing areas of AI in e-commerce are real time product targeting, voice powered search and virtual personal shoppers.

Keywords: Artificial intelligence, E-commerce, Innovations, Recompenses, Techniques, Usage.

Introduction

Artificial intelligence (AI) is the business and science of creating smart machines and smart computer programs. Artificial intelligence is unlike from psychology because it stress on computation and is different from computer science because of its emphasis on observation, way of thinking, perception and action. AI has the strong ability to acquire a huge amount of data and also to interpret consumer decisions for actions. AI in e-commerce helps the companies to collect data and stimulate the individual to buy more and increase the sales in retail industry. AI helps

every industry with innovative and smart business works. AI has pushed the users with the many technological experiences ranging from physical stores to websites and from chat bots to voice assistants. The study has identified various factors regarding the consumer perception towards e-commerce and its areas of applications like personalized shopping experiences for online buyers, real time product targeting, visual search, AI based hiring process, voice powered search, assortment intelligence tool, conversational commerce, customer service, virtual personal shoppers, virtual assistants, AI fake reviews detection, AI based sales process, customer centric advertisements.

Personalized shopping experiences for online buyers: AI helps the online buyers in a way to remember the products which are frequently bought by them, according to customer's interest, based on real time web browsing habits and shopping data.

Real Time Product Targeting: Machine learning can help to present online shoppers with personalized product recommendations, discounts and offers.

Visual search: Image recognition platforms can help e-commerce websites visitors search by image, instead of text, and match relevant products to specific images.

AI based hiring processes: The task of screening applications, reaching out, scheduling face-to-face interviews, and finding matches can be automated through Restless Bandit, software as a service product. This reduces the work of HR by providing the potential candidate for the job.

Voice Powered Search: Voice is slowly replacing text based search in online shopping. Voice recognition accuracy is improved than before.

Assortment Intelligence Tool: Assortment Intelligence tool can assist retailers to have 24/7 visibility and insights into their market competitor and change their pricing accordingly to compete in the market. Retailers can analyze their competitor's product mix and prices by the tool.

Conversational commerce: Chat software can help the shoppers make purchases in a conversational text format using natural language processing. Chat bots are already being used to facilitate online transactions for the big brands, with TacoBot.

Customer Service: AI can influence customer service through the use of chat bots. Chat bots are computer program developed for conversational commerce. Chat bots interact in natural human language to give the customer a personal and satisfied customer service.

Virtual personal shoppers: Virtual personal shopper can assist the people in making the smart decision about their shopping.

Virtual Assistant: E-commerce virtual assistant is a software agent skilled in business support services and technical services. It can also perform tasks or services for an individual. The term "Chabot" can also be used to refer to the virtual assistant. Recently Lenovo has also announced its virtual assistant to compete with Google now and Cortana.

AI fake reviews detection: Customer reviews have become important for consumer trust in the online shopping AI can be used to manage this problem. Amazon also uses AI to combat fake product reviews. Amazon's AI machine-learning system ensures that only verified customer purchase reviews are boosted.

AI based sales process: Integration of AI with the customer relationship management system is an effective solution to manage sales.

Customer-Centric Advertisements: Artificial intelligence programs can be created to deliver customer-centric advertisements.

The above factors were considered for the study which has a high impact towards the applications of AI in E-commerce. The three factors identified in this study are highly significant to the applications of AI.

Review of literature

Vincent Conitzer (2019) has conducted a study on "Designing Preferences, Beliefs, and Identities for Artificial Intelligence" has identified the well found theories of, and methodologies and algorithms for, how to design preferences, identities, and beliefs. This paper lays out an approach to address these problems from a rigorous foundation in decision theory, game theory, social choice theory, and the algorithmic and computational aspects of these fields. **Vanessa Putnam, Cristina Conati (2019)** in their study "Exploring the Need for Explainable Artificial Intelligence (XAI) In Intelligent Tutoring Systems (ITS)" has identified student attitudes towards incorporating explanations to an ITS, by asking participants for suggestions on the type of explanations, if any, that they would like to see. Their results indicate an overall positive sentiment towards wanting explanation and suggest a few design directions for incorporating explanation into an existing IT. **Haluk Demirkan, James C. Spohrer, Ralph Badinelli (2019)** Human-centered smart service systems for business and society can be characterized by: the types of offerings to their customers and/or citizens, the types of jobs or roles for people within them, and the types of returns they offer investors interested in growth and development, through improved

use of technology, talent, or organizational and governance forms, which create disincentives that (re)shape behaviors. An important trend in smart service systems is the increasing availability of cognitive assistants. **Pat Langley (2019)** principles in a proposed course that teaches students not only about component methods, such as pattern matching and decision making, but also about their combination into higher-level abilities for reasoning, sequential control, plan generation, and integrated intelligent agents. We also present a curriculum that instantiates this organization, including sample programming exercises and a project that requires system integration. Participants also gain experience building knowledge-based agents that use their software to produce intelligent behavior. **Nadimpalli M (2017)** the concept of artificial intelligence is valuable in several domains, and it is receiving vast attention. Many researchers from different fields now understand the effects of AI to the different daily human lives. They went ahead to outline its influence on but not limited to retail, health care, crime investigation, and employment. **Shyna K and Vishal M (2017)** in their study “A Study on Artificial Intelligence in E-Commerce” has identified the applications in the e-commerce sector such as real time product targeting, visual search, AI based hiring process, voice powered search, assortment intelligence tool, conversational commerce, customer service, virtual personal shoppers, virtual assistance, AI fake reviews detection, AI based sales process, customer centric advertisements.

Research gap

There are several studies pertaining to AI which explain the operating activities, the pros and cons, the specifications and also the various fields of specializations. There is very few research studies related to consumer awareness and consumer preference. Many research studies have focused on the AI Applications in devices for many uses but very little research study has been done on e-commerce. There were no research studies based on the consumer’s aspect towards AI technology over the e-commerce. This study has looked into the consumer’s perception towards the artificial intelligence.

Objective of the study

To determine the Consumer preference towards the applications of AI in different areas of e-commerce to better understand their customers for their improvement in the competitive business.

Research methodology

The methodology adopted for this study is simple random sampling based on structured questionnaire. Primary data questionnaire from the sample size of 100 respondents were selected from various part of Chennai city. Questionnaire consisted of various areas of performance of AI and applications of AI in e-commerce. Secondary data are collected from various research papers, books, journals, reviews and websites. SPSS version 20.0 statistical software is used and the results obtained thereby have been analyzed and interpreted. Regression analysis and factor analysis were carried out to analyze the objective.

Hypotheses for the study

HO₁- There is no significant relationship between the gender and the usage factors.

HO₂- There is no significant relationship between the gender and the recompenses factors.

HO₃- There is no significant relationship between the gender and the techniques factors.

Data analysis and interpretation

Table1- Demographic profile			
Particulars		Freq.	%
Age	Below 18 years	39	39.0
	18-25 years	45	45.0
	25-30 years	8	8.0
	Above 30 years	8	8.0
	Total	100	100.0
Gender	Male	36	36.0
	Female	64	64.0
	Total	100	100.0
Qualification	Below UG	12	12.0
	UG	20	20.0
	PG	60	60.0
	Professional course	4	4.0
	Diploma	4	4.0
	Total	100	100
Occupation	Private sector	56	56.0
	Public sector	12	12.0
	Own business	16	16.0
	Semi-Public	16	16.0
	Total	100	100.0
Income	Below Rs.20000	72	72.0
	Rs.20000-Rs.30000	16	16.0
	RS.30000-Rs.40000	8	8.0
	Above Rs.40000	4	4.0
	Total	100	100.0
Source: Primary data Analysis			

Interpretation: Table1 shows that out of total 100 respondents in which 39% fall under the age group of 18-25 years where as 45% fall under the age group of 25-35 years 8% of the respondents were from the age group of 35-45 years and the remaining respondents were above 45 years. There were 36% male respondents taken for the study and 64% of the study was done with female respondents. Out of 100 respondents, 12% of the respondents were from below under graduation, 20%

belong to under graduation, 60% were under post graduation, and 4% belong to professional course and the remaining 4% belong to diploma courses. There were 56% respondents who are working in private sectors and 12% respondents were working in public sector, 165 of the respondents were from semi-public sectors and the remaining respondents were having their own business. Out of 100 respondents, 72% of the respondents have monthly income of below Rs.30000, 16% of the respondents have monthly income between Rs.30000-Rs.40000, 8% of the respondents have monthly income between Rs.40000-Rs.50000 and 4% of the respondents have a monthly income of above Rs.50000.

Factor analysis

Table 2- KMO and Bartlett's test		
Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy.		.731
Bartlett's Test of Sphericity	Approx. χ^2	298.490
	Df	78
	Sig.	.000**
Significant level at 0.01** levels.		
Source: Primary data Analysis		

Interpretation: In Table 2, a KMO score of 0.731 is an acceptable score and factors with the score of 0.6 and above were selected for the study.

Table3- Communalities table		
	Initial	Extraction
Personalized Shopping Experiences for Online buyers	1.000	.876
Real time product targeting	1.000	.816
Visual Search	1.000	.941
AI based hiring process	1.000	.842

Voice powered search	1.000	.663
Assortment Intelligence tool	1.000	.884
Conversational Commerce	1.000	.763
Customer Service	1.000	.629
Virtual Personal Shoppers	1.000	.697
Virtual Assistants	1.000	.735
AI fake reviews detection	1.000	.822
AI based sales process	1.000	.670
Customer centric advertisements	1.000	.603
Extraction Method: PCA		
Source: Primary data Analysis		

Interpretation: Table 3 communalities explains the initial Eigen values of the above 13 factors which are considered to be the areas of applications of AI in E-commerce. It is observed from the above table that customer centric advertisements has the least value of 0.603 which is less than 73% which implies that customer centric advertisements is the least preferred applications factor in the areas of E-commerce. It is also observed that Visual Search has the highest value of 0.941 which is higher than 73% which implies that customer centric advertisements is the highly preferred applications factor in the areas of E-commerce. The above factors contribute 62% to 94% which implies these factors have greater preference among the applications of AI in the areas of e-commerce.

Factors	Elements	Factor Loading	Eigen Value	Cumulative % of Variance
USAGE	Virtual Personal Shoppers	.763	49.009	49.009
	Customer Service	.700		
	Conversational Commerce	.603		
	Virtual Assistants	.569		

	AI based hiring process	.469		
RECOMPENSES	Real time product targeting	.858	17.576	66.584
	AI fake reviews detection	.801		
	Visual Search	.775		
	Personalized Shopping Experiences for Online buyers	.756		
TECHNIQUES	Voice powered search	.793	9.888	76.473
	Customer centric advertisements	.710		
	Assortment Intelligence tool	.613		
	AI based sales process	.578		
Source: Primary data Analysis				

Interpretation of Table 4:

- Component 1 is labeled as **USAGE** which comprises of factors like AI based hiring process, Conversational Commerce, Customer Service, Virtual Personal Shoppers, Virtual Assistants where Virtual Personal Shoppers has the highest score of 76%.
- Component 2 labeled as **RECOMPENSES** comprises of factors like Personalized Shopping Experiences for Online buyers, Real time product targeting, Visual Search, AI fake reviews detection, where Real time product targeting has the nearest score of 86%.
- Component 3 labeled as **TECHNIQUES** which comprises of factors such as Voice powered search, Assortment Intelligence tool, AI based sales process, Customer centric advertisements where Voice powered search has the nearest score of 79%.

Regression analysis

Further the above three components are tested with the demographic factor gender for better understanding. The following hypotheses are framed to test the regression model.

HO₁- There is no significant relationship between the gender and the usage factors.

HO₂- There is no significant relationship between the gender and the recompenses factors.

HO₃- There is no significant relationship between the gender and the techniques factors.

Table-5 Model summary						
Model	R	R Square			Change statistics	H0

			Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Sig. F Change	Accepted/ Rejected
1	.219 ^a	.048	.038	4.73130	.048	4.925	.029*	Accepted
2	.211 ^a	.045	.035	2.64939	.045	4.575	.035*	Accepted
3	.147 ^a	.022	.012	3.17230	.022	2.164	.144	Rejected
Predictors: (Constant): Income								
Dependent Variable: Usage, Recompenses, Techniques								
** 0.01 significant level; * 0.05 significant level.								
Source Primary Data Analysis								
Model 1- Usage; Model 2- Recompenses; Model 3- Techniques								

Interpretation: Table 5 shows that the coefficient determination of R Square for model1 is 0.048. It indicates that Usage have contributed up to 4.8 % towards artificial intelligence in E-commerce. The coefficient determination of R Square for model 2 is 0.045. It indicates that Recompenses have contributed up to 4.5 % towards artificial intelligence in E-commerce. The coefficient determination of R Square for model 3 is 0.022. It indicates that Techniques have contributed up to 2.2 % towards artificial intelligence in E-commerce.

Model		Sum of Squares	Df	Mean Square	F	Sig.	H0 Accepted/ Rejected
1	Regression	110.250	1	110.250	4.925	.029*	Rejected
	Residual	2193.750	98	22.385			
	Total	2304.000	99				
2	Regression	32.111	1	32.111	4.575	.035*	Rejected
	Residual	687.889	98	7.019			
	Total	720.000	99				
3	Regression	21.778	1	21.778	2.164	.144	Accepted
	Residual	986.222	98	10.063			
	Total	1008.000	99				
a. Dependent Variable: Usage, Recompenses, Techniques; b. Predictors: (Constant), Gender							
** 0.01 significant level; * 0.05 significant level.							
Source: Primary Data Analysis							

Interpretation: The hypotheses are further tested by ANOVA in Table 6.. In model1 F value 4.925 and significance value 0.029, p indicates that there is a significant relationship between the gender and the usage factors. In model 2 F value 4.575 and significance value 0.035, p indicates that there is a significant relationship between the gender and the recompenses factors. In model 3 F value 2.164 and significance value 0.144, p indicates that there is no significant relationship between the gender and the techniques factors.

Table 7 shows the coefficients of the models.

Table 7 Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.188	1.684		9.611	.000**
	Gender	-2.187	.986	-.219	-2.219	.029*
2	(Constant)	10.736	.943		11.383	.000**
	Gender	-1.181	.552	-.211	-2.139	.035*
3	(Constant)	11.194	1.129		9.912	.000**
	Gender	-.972	.661	-.147	-1.471	.144
a. Dependent Variable: Usage, Recompenses, Techniques						
** 0.01 significant level; * 0.05 significant level						
Source: Primary Data Analysis						

3 Table 8 shows the regression equations were derived from the Analysis Tables 6 and 7.

Table-8 Regression equations	
Model 1 (Usage)	$Y=16.188(\text{gender}) - 2.187x_1(\text{Usage})$
Model 2 (Recompenses)	$Y=10.736 (\text{Gender})-1.181x_1(\text{Recompenses})$
Model 3 (Techniques)	$Y=11.194(\text{Gender})-0.972x_1(\text{Techniques})$

Findings from the study

Demographic profile: The majority respondents for the study were female from the age group of 18-25 years have completed their Post-Graduate working in the private sector and earning Below Rs.30000. **Factor Analysis:** Three components were identified while loading the entire 13 variable that are the applications of AI in e-commerce. The first component was named as **Usage**

where the factor virtual personal shoppers have the highest score of 76% because it can assist the people in making the smart decision about their shopping. Virtual personal shoppers provide the customer modern shopping experience and only needs to verify your voice pattern to process the order. The second component was named as **Recompenses** where the factor Real time product targeting have the highest score of 76% because the Companies aim to offer their customers a best offline shopping experience to the online space, by offering the consumers a hassle-free way to discover the products they are looking for. The third component was named as **Techniques** where the factor Voice powered search have the highest score of 79 % replacing text based search in online shopping. **Regression Analysis:** The regression analysis further supports the factor analysis by rejecting the null hypothesis for the techniques factors accepting the null hypothesis for the usage and recompenses factors and reinstates that gender as a predictor in explaining usage, recompenses and techniques. In this regression analysis three models were derived for understanding applications of areas of AI in e-commerce. The model 1, usage and the model 2, Recompenses have a positive impact in understanding applications of areas of AI in e-commerce towards gender and the model 3 Techniques have a negative impact in understanding applications of areas of AI in e-commerce towards gender.

Conclusion

India is the fastest growing country in the e-commerce where many technologies and inventions are used. AI has a broader scope for widening in many aspects and areas. Nowadays people are more and more aware of the AI technology and they are using it. The study highlights the areas of applications of AI in e-commerce. The research results show there has been a wider scope for the AI technology to increase in various fields. Since AI has been moving in an upward scenario that paves way for many new inventions in many areas. AI many create a new revolution and also gives way for new data sciences and machine learning.

Suggestions

AI will have a significant effect on the way e-commerce businesses attract and retain customers. AI revolution in e-commerce will create plenty of new data science, machine learning and engineering. AI based e-commerce will also generate IT jobs to develop and maintain the systems and software. But the new inventions may result in demand for skills and also for

unemployment in the upcoming years. People should not only be aware of the AI, but the individuals should know how to use and construct them and also to bring about the broad range abilities associated with human intelligence.

Scope for further research

This research work may form a basis for the future researchers, as the study has identified only the perception factors of the AI and also has identified the awareness factors. Future researchers can widen their research on the risk and the challenges or the disadvantages faced by the users. The research can also be widened on the inner operating activities or the data used by the technicians can also be studied.

References

- 1) Haluk Demirkan, James C. Spohrer, Ralph Badinelli (2019) Proceedings of the 52nd Hawaii International Conference on System Sciences 2019 Introduction to the Smart Service Systems: Analytics, Artificial Intelligence and Cognitive Applications Haluk Demirkan U. of Washington-Tacoma haluk@uw.edu James C. Spohrer IBM Almaden Research Center spohrer@us.ibm.com Ralph Badinelli Virginia Tech ralphb@vt.edu.
- 2) Nadimpalli M (2017) Artificial Intelligence Consumers and Industry Impact. Int J Econ Manag Sci 6: 429. Doi: 10.4172/2162-6359.1000429.
- 3) Pat Langley (2019) this research was supported in part by Grants N00014-15-1-2517 and N00014-17-1-2434 from the Office of Naval Research, which are not responsible for its contents. An Integrative Framework for Artificial Intelligence Education Institute for the Study of Learning and Expertise, 2164 Staunton Court, Palo Alto, CA 94306 USA Department of Computer Science, University of Auckland, Private Bag 92019, Auckland 1142 NZ.
- 4) Shyna K and Vishal M (2017). “A Study on Artificial Intelligence in E-Commerce” International Journal of Advances in Engineering & Scientific Research, Volume 4, (Issue 4, Jun-2017), pp 62, ISSN: 2349 –3607 (Online), ISSN: 2349 –4824 (Print).
- 5) Vanessa Putnam and Cristina Conati 2019- “Exploring the Need for Explainable Artificial Intelligence (XAI) in Intelligent Tutoring Systems (ITS)” In Joint Proceedings of the ACM IUI 2019 Workshops, Los Angeles, USA, March 20, 2019, 7 pages.

- 6) Vincent Conitzer (2019) Designing Preferences, Beliefs and Identities for Artificial Intelligence
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USA.