Impact of Artificial Intelligence in Online Customer Satisfaction: An Empirical Study using Multiple Regression Analysis

[1]Dr. Nirmal Singh, [2]Prof. (Dr.) D. D. Chaturvedi, [3]Prof. (Dr.) Anand Mittal, [4]Dr. Arjun Mittal*

[1]Associate Professor in Economics, Sri Guru Gobind Singh College of Commerce, University of Delhi

[2]Professor in Economics, Sri Guru Gobind Singh College of Commerce, University of Delhi, New Delhi 110034,

[3]Professor and Teacher in Charge, Department of Economics, Hansraj College, University of Delhi

[4]Assistant Professor in Commerce, Hans Raj College, University of Delhi, Formerly Assistant Professor in Commerce Shri Ram College of Commerce, University of Delhi

Corresponding Author (email: dr.arjunmittal@gmail.com)

Abstract

Artificial intelligence has eased the customer-marketer interaction in online retailing by automizing the shopping activity with customized recommendations. AI has played a huge role in upgrading the retail business. In this paper, we have brought together the various benefits that customers have perceived during their shopping experience with AI enabled online retailers. We took a sample of 334 online consumers to determine the Role of AI in transforming online business and their impact on Customer Satisfaction. Exploratory Factor Analysis (EFA) and Multiple Regression were used to analyze the data. It was found that AI Based Product Recommendations, Personalized shopping experiences, Instant Interaction and Chatbots positively influence Customer Satisfaction with AI enabled online retailer.

Keywords: Online Retailing, Product Recommendations, Automation, Artificial Intelligence, E-tailing

Introduction

E-Commerce and Online Retailing

The modern concept of E-Commerce is to facilitate transactions related to the products among different sellers and buyers across the globe, which is popularly known as the marketplace model. The transactions are done online through internet enabled smart mobile and computer devices. The different kinds of e-retail businesses range from business to business, in which other businesses such as manufacturers sell their goods to the wholesaler (Štefko et al., 2019); Business to Customer (B2C), in which a business sells to the ultimate users and consumer to consumer (C2C) in which individuals sell goods to each other. This study focuses on C2C business in which customers or ultimate users buy the goods and services from online retailers or marketplaces. In a generic way, the payments are done online or through Cash on Delivery, and goods are delivered through delivery partners via vendors. The life of consumers has become much easier and convenient because of the online retail industry (Omonedo & Bocij, 2014). Consumers can avail themselves of the products or services they need at any instant with just a few clicks. The products which are not available in the neighborhood are also found on the E-Commerce platform and can be availed at the doorstep. This process saves time and energy. Physical transactions have been transformed into digital transactions.

Artificial Intelligence:

Artificial Intelligence (AI) in business has become a trending concept. AI enabled systems promise to improve the experience that humans have already been using. AI is defined as the engineering and science used in making machines intelligent and capable for decision making (Chui, 2017). AI systems take prompt actions or provide a feasible solution based on the data it has gathered through various sources. The decisions taken by AI are usually successful because it takes the inputs from real-life or similar data. The entire system is associated with the protocols which have been made for the functioning of a particular task. In this way, the system learns to find the appropriate reason for meaning of the process and gives out the desired results (Fenwick, et al., 2019). AI is important for all industries, such as in healthcare AI supports data mining and diagnosing patients with utmost accuracy and providing the right kind of treatment based on the prevalent medical conditions that a person has. It also supports in medical imaging, drug Discovery, management of medication, and robotic surgeries (Panch, et al., 2018). In the food processing business AI helps in food sorting. Analyzing various components such as size, color, shape, and fat content as well (Rampersad, 2020). In Agriculture, AI helps in creative methods for raising the perfect crops and thereafter determining the correct time to enrich them with other

nutrients and, at last, harvesting them (Singh et al., 2016). The present study focuses on AI in online retailing. E-tailing is a business where performance of AI is receivable to the consumers or the end users (Maia et al., 2020). Therefore, by analyzing the consumer behavior and the buying patterns of the individuals the use of AI can be put into place for targeting the customers and buying their attention towards the brand. Leveraging Technology could be one important aspect for retail business professionals to target customers and win over those competitors.

Literature Review

AI gives companies a huge advantage over other players in the market. Some important AI applications are - recommendations to users about products, tracking the choices, offering real time discounts etc. (Davenport, et al., 2020). The technology gathers data from the patterns of product search, the number of times a person views a category of product, kind of products a person likes and would want to buy and other similar insightful information. This information is analyzed to provide recommendations which most likely persuade a person to buy relevant products. Similarly, chatbots, which are AI based applications, contribute significantly to solving variety of objections that a customer may face while buying products (Michiels, 2017). These chatbots, which are placed on the E-Commerce websites, are also examples of artificial intelligence which are programmed in a manner that they can give response to the queries which the consumers type in (Lee, 2020).

Retail companies like Amazon have an impressive share of 35% in the total revenue earned by them through the process of cross-selling and upselling the products which are available on their platform, that is, the application and the E-commerce website of Amazon. The platform built by Amazon is popularly known as a huge success story that Amazon has created to date, which is enabled by artificial intelligence. The major function which is contributing to the growth of Amazon is the product recommendation Technology which is bringing in more customers in the targeted segment of Amazon (Tou et al., 2019). AI is interpreting the comments of the customers to create a customer experience for them by not only recommending the kind of products they are likely to buy but also providing useful chat services over E-Commerce platforms. Online Shoppers are heavily dependent on the ratings and reviews of other customers. Therefore, the E-Commerce or retail businesses which are doing good in the industry are making sure that the application is designed in a manner that they are user-friendly and suggest to the customers what is best for them. These interfaces are created by the best of Technology such as AI and machine learning and so on. In a study, it was found that 56% of customers accepted that their willingness for buying products was generated by the chatbots.

Chatbots also suggest discounts and offers, thereafter, online Shoppers are inclined to buy those products as they feel lucky to get those products at lower prices than expected (Roggeveen et al., 2021). The E-retail business has crossed $4.8 billion globally, which is undoubtedly a huge number and suggests that more customers are switching to e-retail because of the attractive e-commerce platforms built by the companies. Gartner has found that approximately 80% of the interactions done with consumers will be managed by artificial intelligence-based systems in the coming couple of years (Yablonsky, 2019). A very common example of artificial intelligence in the retail business is by predicting buying behavior or shopping patterns based on the kind of products a person has been buying on a regular basis. For instance, if an individual is buying rice or flour from his or her favorite brand frequently then the retail organization could create a customized offer for this individual so that he sticks to this platform to buy his product. The retailer could also send personalized discounts or offers every week along with a list of recommendations that could go along with the product he or she is buying. This recommendation is often based on machine learning and has helped many retail businesses to attract more customers. In the retail sector organizations are also helping the consumers to prepare a grocery list for themselves. One such example is the Google duplex tool (Appel et al., 2020). The consumers can add their items and save them for future use so that whenever they need to refill their kitchen, they can directly place the order or ask the app to do the same for them. Customer experience is the most important factor in organizations dealing with retail business. The experience of customers can be improved by 24*7 services provided by retail companies with the use of virtual assistants. Retailers are impressed by the results shown by AI based chatbots and they feel they are the most useful application of artificial intelligence in the e-retail business. The additional customer support or assistance provided by the chatbots is developed by the AI technology through different sets of capabilities like natural language processing which can easily detect consumer needs and demands through voice-based interactions (Okuda & Shoda, 2018). These interactions help to decipher consumer needs by analyzing the patterns of purchase as well as the queries that they put forth in the chat boxes available on the E-Commerce platforms. The technology which is running behind the chatbot enhances self-learning

abilities which can be useful in improving the customer experience soon while also helping organizations to be in touch with the customers.

The personalized touch that is provided to the consumers with the help of specific recommendations for targeted discounts and offers makes customers happy and ensures that they come back to the same retailer to purchase their products. Earlier the retail business was perceived as a simple give-and-take phenomenon where the seller sells his products to the consumer and the consumer pays the amount for its value in a physical medium like shops in the markets. The advancement in web-based technologies and the digital transformation in commerce has pushed its limits like never. E-Commerce has built up an advanced platform for the retailers to sell their products in innovative ways by leveraging the technology such as machine learning, artificial intelligence cloud-based Technology and so much more (Dash, et al., 2019). There are ample opportunities in the retail sector to grow and succeed by optimizing technology to enhance customer service. Artificial intelligence has been termed a cool factor in businesses which helps in identifying the potential areas of development and making the processes smooth to enhance productivity in different areas of business (Chan, 2020). With the use of data mining retail businesses gather the present as well as the historical data of the consumers and thereafter encompass it with natural language processing to interpret the comments for the interactions that the computer has had with the consumers. E-Commerce businesses can also use machine learning to its full potential for solving any kind of problem that is occurring within the operations by the method of deep learning (Saleem et al., 2019). It consists of different algorithms, which is again impactful altogether as it helps to Grab a better understanding of the information which is available in system.

In the last few years artificial intelligence has proved to be a booster in the retail business, which has upgraded the number of saves and has helped businesses to run smoothly by optimizing their operations. Small retail businesses have also understood the importance of AI and machine learning in this sector and are therefore using AI to leverage their businesses. A company named Twiggle is working on making search engines smarter than it was earlier (Demchuk et al., 2019). It enables search engines to work exactly the way humans think and make decisions. It has been witnessed that the e-commerce experiences of individuals are often irrelevant because the products which are displayed on the homepage seem not so useful to them. This is the reason Twiggle has come up with the concept of making a smart search engine that works on natural language processing to analyze, contextualize, and determine the relevant product for the consumers using an improved search process.

There are certainly other businesses that are constantly improving the techniques and tools which are used in the e-commerce business to modify the processes. Another retail company that is keen on developing artificial intelligence-based systems has focused on the important perceivable elements used in the search option, which is explicitly stated by the company on its website as well as "Artificial Intelligence with a vision" (Ng, 2016). The company focuses on building an entire system of artificial intelligence which is used for making smarter apps that have the capability to empower businesses and give the word the experience to the customers. This is usually done via a developed form of an image as well as a video recognition method. The written businesses also incorporate custom training for the artificial intelligence tools that they are using in the organization. In this training, they usually build certain Bespoke models, which is a platform where the artificial intelligence tool is made to understand and clear the concepts or theories about the kind of logos, aesthetic, or any kind of program (Niraj & Nageswara Rao, 2015).

As AI is developing significantly, retailers expect exceptional proposals on the customer's PC screens in view of their in-store stay time. The retailers who are catering to customers in several places are starting to sell their products again and again to the same customers. However, the results are a bit different. The deals are being done by directly reaching the clients in their surroundings whether online or offline. The products which are liked and bought by customers are easily accessible and the availability of those products is never a problem for them. All the well-functioning provider networks, inventory or demand and supply are in a good flow because of the use of technology in the operations of the business.

There has been a sharp development in the retail business. Particularly since the business of e-retail began about 10 years prior, the need to digitize and digitalize, save costs, and computerize the methods of dealing is somewhere on the top priorities of retailers. These endeavors in the retail industry follow an arranged process, among others, expected to improve the shopping experience and empower retailers to reexamine themselves and their purchasing decisions (Guven,

et al., 2016). Development, changes in plans of action, the internal as well as external business environment, the reception of new advances, an emphasis on brand reason and the actual worth of the products as perceived by buyers, various ways of connecting with customers; they're all important for this continuous exercise. Among the many difficulties, the authors have observed have disintegrating edges, the development of online retail business, simultaneous declining visits to shopping centers, the accomplishment of small-scale retailers, and changing purchaser needs and demands. The list is unending. Retailers have been exploring different avenues regarding the way of reacting to new customer queries.

A few chains have opened idea stores to perceive how purchasers are interfacing with explicit technological advancements and administrations prior to carrying them out to more retail stores. Most would agree that the retail business is among the enterprises that are generally impacted by advanced business change for a considerable length of time as they shift towards more digital models, with numerous conventional capacities, cycles and tasks being digitalized (Satnalika & Rao, 2016). The present customer base isn't advanced. They still predominantly prefer to shop in a store. Since the digitally savvy purchaser basically is a shopper who showcases evolving behavior, no matter what the instruments or channels, or encounters they use and look for. The assumptions for a regular, loyal customer and shopping experience across various touchpoints and channels, by which the shopper shows supportive behavior towards a brand and looks for experiences that are as simple, quick, and frictionless. However, in some exemplary cases, as presented by top-tier retailers and different organizations, there is a quick admittance to data in the e-retail business. The data and administration assumptions customers have from store staff. The requirement for data about the available products and shops is clear in a digital or online platform. Nonetheless, the brand's customer likewise needs quick data in an in-store setting and that affects the staff and, the need, to enable it with the legitimate availability and resources to conform to it (Mahalakshmi & Kathiravan, 2019). On the other hand, buyers are becoming accustomed to self-administration, self-checkout and tracking down data and backing themselves with whatever assistance they require during their purchase. There is sufficient versatility on the internet-based retail business.

Retail clients utilize advanced devices in a few phases of the shopping venture, regardless of whether 90% of in-store exchanges happen on online platforms. To remain open and serious with digitally savvy individuals, they should alter the way they acquire customers. Nonetheless, carrying out innovation for doing such isn't useful. All things considered, retailers should direct their concentration toward the client and how they have changed as of late. "Such countless retailers are falling flat since there's as yet a distinction with who the purchaser is, and what they shop, and why they shop, and how they shop", said Brian Solis, a central examiner at Altimeter Group (Hussain & Manhas, 2016). A decent client experience is indispensable to the achievement of any retailer. However, just 35% of organizations going through advanced changes have concentrated on client development because of innovation's effect on their shopping practices, down from 56% the prior year, as indicated by Solis' examination. Organizations appear to be executing innovation without truly thinking about the explanation. The changing idea of retail implies tech pioneers have an interesting and receptive mindset to design a tech-energized, client-focused shopping experience. "The job of the CIO or the innovation designer today is really one of development, and it's both advancements as far as innovation arrangement yet in addition development in what that job is in characterizing the eventual fate of retail, or anything besides." Among other computerized advances, AI assumes a larger part in the e-retail business. Artificial intelligence is mechanizing and tweaking retail insight, intending to make shopping simpler for the customer. Concurring Deloitte, over 33% of significant brand pioneers are utilizing AI to further develop business. One significant AI development is the advancement of clerk less stores. Amazon Go, a completely mechanized supermarket in Seattle, dispenses with checkout lines and clerks. Amazon is set to open two additional stores in San Francisco and Chicago. Voice enactment AI is so well known it merits a different slug. Regardless of whether it's educating your Google Home to get you things or requesting that Siri looks for a thing on the web, voice control has acquired notoriety in the retail space (Sahoo, 2016).

The voice actuation is currently even accommodating for retail representatives: For instance, with 'Theatro,' workers can convey all through a store by means of voice-controlled wearables. Purchasers have more ways of illuminating themselves, purchasing, looking for administration and playing out any study in the retail venture than they had done previously. It's not just about conveying the previously referenced assumptions to succeed in the retail industry. Every customer is unique, and each shopping venture is unique. To wrap things up, all the mental, situational, deliberate, and

logical elements are unique. Retail is one of the most quickly changing verticals across the world and is frequently at the front line of developments and progressions to stay up with the advancing necessities of an ever-changing market.

Demand forecasting has turned into a vital part of the eCommerce and retail industry. While scholars frequently have analyzed it physically with the utilization of ERP. It is useful to find answers for advanced stock levels, increment effectiveness and hoist client interactions. Progressions in AI have taken an interest in estimating to a great level. Customary retail request estimating frameworks commonly include dissecting authentic deals information along with occasional varieties (Kumar & Garg, 2018). It is a complex issue and is affected by different elements. Digitalization and the advent of other technologies including AI-controlled explicit frameworks are equipped for utilizing information from numerous sources and inferring important insights with connections between them which can be solid indicators of interest. These frameworks regularly give more precise indications as an ever-increasing number of provable information opens, which demonstrates its value that is sought after anticipating the retail business. Producing an exact figure is entirely basic under stable circumstances. However, it is seen too well that retail is intrinsically unique, with many variables affecting interest consistently. Consistently, retail request organizers battle to think about a colossal number of factors. As the consumers' interest is dynamic and keeps changing from time to time, the technological aspects must also be molded in a similar way to fit the needs of the buyers. An interest estimating framework furnished with properly placed protocols in the AI-based system, can empower the business by improving stock levels, exceptionally viable portraying and positioning of products, and optimized usage of technological advancements, as well as less worker hours spent on the forecasting process. It additionally empowers adaptability to adjust to changes in the current cycles (Fortuna, et al., 2021). Organizations face different stock difficulties when they are managing supply chains. Particularly in the current environment, tending to store network issues is central. Request forecasting assists organizations with decreasing inventory network costs and acquiring critical upgrades monetary preparation, scope quantification, overall revenues, and hazard evaluation choices. As per Gartner's overview, request forecasting is the most generally involved AI application in inventory network arranging. The review features that 45% of organizations are as of now utilizing the innovation and 43% of them want to utilize AI-fueled interest anticipating within two years (Fontaine, et al., 2019). As specified by Mckinsey Digital, AI-fueled forecasting can reduce the errors by 30 to half in production network organizations. Superior precision paves the way to a 65% decrease in lost deals because of stock inaccessible conditions and warehousing costs decline around 10 to 40%. The evaluated outcome of AI in the store network is somewhere in the range of $1.2T and $2T in assembling and inventory network arranging. Customary anticipating models like ARIMA, Autoregressive Integrated Moving Average, and outstanding smoothing strategies, where just provable evidence is thought of, are getting outdated on account of the extended measure of information produced from organizations and outside sources. With execution of AI into production network of the organizations and the executives can work on the appropriateness of estimated results and enhance their plans regarding the business (Pandey, et al., 2014). AI conveys requests anticipating to the following stage: it empowers improved figures in view of constant information utilizing all kinds of information sources like socioeconomics, climate, online audits, as well as online media.
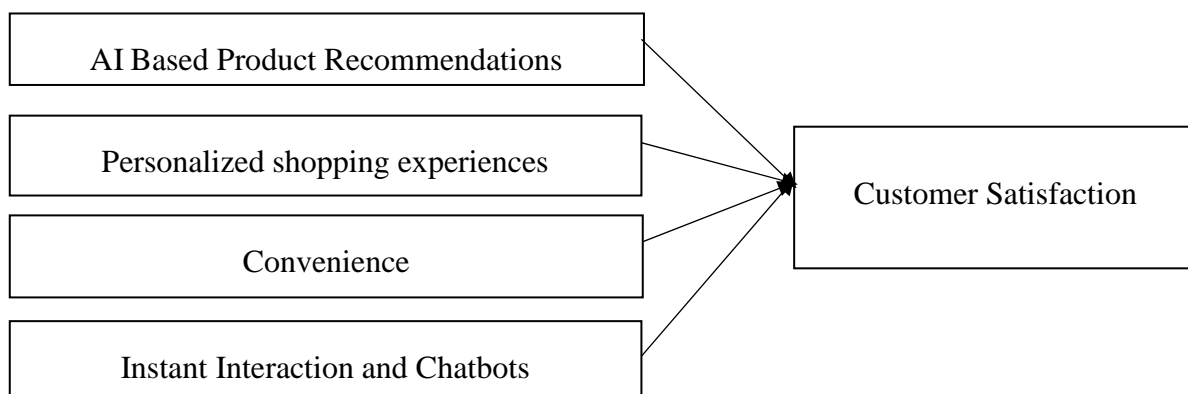
Conceptual Framework of the Study:

Figure 1 Conceptual Framework of the Study

Objectives of the Study

1. To determine the factors determining the Role of Artificial Intelligence in transforming the E-retailing Business.
2. To measure the impact of AI enabled Retailer services on Customer Satisfaction for Online Retailing

Hypotheses:

Ha₁ AI Based Product Recommendations positively influences Customer Satisfaction
Ha₂ Personalized shopping experiences positively influences Customer Satisfaction
Ha₃ Convenience positively influences Customer Satisfaction
Ha₄ Instant Interaction and Chatbots positively influences Customer Satisfaction

Methodology:

Research Design: This study is based on primary data collected from the consumers, who are the direct and end-users of the retail services. Survey method has been used to collect the data. (Malhotra, 2007; Chawla & Sondhi, 2011). The nature of research is quantitative. In this study the method of deduction is found to be more accepted than the inductive one due to its approximation to scientific research (Sardar & Sheikh, 2021; Daowd et al., 2020).

Sample Size and Source of Data: In this study we are applied "Exploratory Factor Analysis" and "Multiple Regression Analysis". General Assumption of sample size for factor analysis is that the sample size should not be less than the 10 respondents per item or statement (Hair et al., 2006). In case of Multiple Regression, the minimum sample size in multiple regression should be multiple regression or $N \geq 104 + m$, where m= number of predictors (Green, 1991). This research has four predictors (after précising by factor analysis); hence the minimum sample size required is $104+4 = 108$ (Burmeister & Aitken, 2012). Here as per the statements (24) the requirement is 240 respondents and/or 108 respondents. The data were collected from 334 customers which fulfils the minimum requirements of EFA as well as CFA. Only those respondents were considered for filling the complete and final questionnaire who experienced AI based online retail shopping. To ensure these 5 statements was included in the questionnaire as qualifier.

Data Analysis Techniques: In this study, firstly EFA has been used for data reduction, (Field, 2017). Multiple regression was applied to determine the effect of various benefits of AI in online retailing on Customer Satisfaction. The independent variables in the form of factors were represented by the "Factor Scores" obtained from the EFA process. The set of variables, along with their respective codes has been presented in Table 1:

Table 1: Details of the Dependent and Independent Variables

Variables	Type of the Variable	Denotation
AI Based Product Recommendations	IDV	β_1
Personalized shopping experiences	IDV	β_2
Convenience	IDV	B_3
Instant Interaction and Chatbots	IDV	B_4
Customer Satisfaction (Dependent Variable)	DV	Y
Constant		α

Note: IDV- Independent Variable, DV – Dependent Variable

Multiple Regression Equation proposed:

Y =   "α (Constant) + $\beta_1 *(X_1) + \beta_2 *(X_2) + \beta_3 *(X_3) + \beta_4 *(X_4) + \epsilon$"

Y = Dependent Variable

α = Constant or Intercept

β_1 to β_4 = Parameters to be estimated

ϵ = Error Term or Residual

Finding:

Table below is sharing general details of the respondents in which it is found that 60.8% of male and 39.2% of female are contributing to total 334 respondents. Among them 29.3% are below 24 years of age, 40.1% belong to the age category of 24-38 years and the rest 30.6% are above 38 years of age. 24.2% of them are students, 22.7% are housewife, 19.8% are salaried, 21.0% are professionals and rest 12.3% are in business or self-employed. 27.8% of the respondents have monthly income of Below Rs. 50,000, 39.5% are earning Rs. 50,000-1.00000 every month and the remaining 32.6% are earning Above Rs. 1,00000 monthly.

Table 2: Respondent's Profile

Variables	Respondents	Percentage
Gender		
Male	203	60.8
Female	131	39.2
Total	**334**	**100**
Age (years)		
Below 24 Years	98	29.3
24-38 Years	134	40.1
Above 38 Years	102	30.6
Total	**334**	**100**
Occupation		
Students	81	24.2
Housewife	76	22.7
Salaried	66	19.8
Professional	70	21.0
Business or Self Employed	41	12.3
Total	**334**	**100**
Monthly Income		
Below Rs. 50,000	93	27.8
Rs. 50,000-1.00000	132	39.5
Above 1,00000	109	32.6
Total	**334**	**100**

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.894
Bartlett's Test of Sphericity	Approx. Chi-Square	6160.445
	df	276
	Sig.	.000

Table 3 shows the value of KMO is 0.894, which means that the sample size for Factor Analysis is adequate, and the "Bartlett's Test of Sphericity" is also significant.

Table 4: Total Variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% Of Variance	Cumulative %	Total	% Of Variance	Cumulative %
1	8.680	36.167	36.167	4.200	**17.500**	17.500
2	3.007	12.531	48.698	4.095	**17.064**	34.564
3	2.224	9.266	57.963	3.403	**14.180**	48.743
4	1.952	8.135	66.099	3.375	**14.062**	62.805
5	1.656	6.900	72.998	2.446	**10.193**	**72.998**
6	.845	3.519	76.517			
7	.748	3.119	79.636			
8	.624	2.598	82.234			
9	.520	2.166	84.400			
10	.475	1.979	86.379			
11	.428	1.784	88.163			
12	.411	1.712	89.876			
13	.363	1.511	91.387			
14	.324	1.349	92.736			
15	.291	1.210	93.946			
16	.226	.941	94.887			
17	.215	.896	95.783			
18	.201	.836	96.619			
19	.183	.763	97.383			
20	.157	.656	98.039			
21	.141	.587	98.625			
22	.127	.531	99.157			
23	.114	.474	99.630			
24	.089	.370	100.000			

Table 4 shows that 24 variables form 5 Factor, and the factors explained the variance of 17.500%, 17.064%, 14.180%, 14.062% and 10.193% respectively and the total variance explained is 72.998%.

Table 5 Factors, Factor Loading and Reliability

S. No.	Statements	Factor Loading	Factor Reliability
	AI Based Product Recommendations		**.953**
1	I get relevant product recommendations while buying online	.858	
2	AI based product recommendations reminds me what I have forgot to buy	.855	
3	AI help to recommend me products that should be bought together	.837	
4	AI based recommendations optimize my product basket	.828	
5	I do not require a shopping list with an AI enabled online store	.775	
	Personalized shopping experiences		**.936**
6	AI enabled online retailers remembers my preferences	.904	
7	AI enabled online retailers send me customized discounts and offers	.892	
8	AI enabled online retailers make me feel exclusive	.877	
9	AI enable online retailers reminds me for my own needs	.872	
10	AI enabled online retailers take care of shopping queries on my behalf	.769	
	Convenience		**.877**
11	AI enabled online retailers saves my shopping time	.852	

12	AI enabled online retailers makes my product search easy	.827	
13	AI enabled online retailers remember my preferences	.777	
14	AI enabled online retailers help me searching appropriate product	.739	
15	AI enabled minimizes my shopping efforts	.654	
	Instant Interaction and Chatbots		**.878**
16	Chatbots are instantly available	.819	
17	Chatbots guide for desired website navigation	.818	
18	Chatbots solve most of the queries	.799	
19	Using chatbots is easier than customer case service	.745	
20	Virtual Assistants are available 24*7	.699	
	Customer Satisfaction (Dependent Variable)		**.752**
21	My experience of dealing with AI enabled online retailers has been good.	.793	
22	I will not hesitate to recommend an online retail website that uses AI	.740	
23	The shopping experience with an AI enabled online retail website has met my expectations	.729	
24	Overall, I am satisfied with my shopping from an AI enabled Retailer.	.700	

Table 5 shows different factors related to Role of Artificial Intelligence in transforming the E-retailing Business and its associated variables where first factor is "AI Based Product Recommendations" which includes the variables like I get relevant product recommendations while buying online, AI based product recommendations reminds me what I have forgot to buy, AI help to recommend me products that should be bought together, AI based recommendations optimize my product basket and I do not require a shopping list with an AI enabled online store. Second factor is named as "Personalized shopping experiences" and its associated variables are AI enabled online retailers remembers my preferences, AI enabled online retailers send me customized discounts and offers, AI enabled online retailers make me feel exclusive, AI enable online retailers reminds me for my own needs and AI enabled online retailers take care of shopping queries on my behalf. Third factor, Convenient includes the variables like AI enabled online retailers saves my shopping time, AI enabled online retailers makes my product search easy, AI enabled online retailers remember my preferences, AI enabled online retailers help me searching appropriate product and AI enabled minimizes my shopping efforts. Fourth factor, Instant Interaction and Chatbots includes the variables like Chatbots are instantly available, Chatbots guide for desired website navigation, Chatbots solve most of the queries and using chatbots is easier than customer case service. Fifth factor, Virtual Assistants are available 24*7, and its associated variables are Customer Satisfaction, my experience of dealing with AI enabled online retailers has been good, I will not hesitate to recommend an online retail website that uses AI, the shopping experience with an AI enabled online retail website has met my expectations and overall, I am satisfied with my shopping from an AI enabled Retailer.

Table 6: Reliability Statistics

Cronbach's Alpha	N of Items
.914	24

The reliability for 5 constructs that includes total 24 numbers of items is 0.914.

Table 7: Model Summary

"Model"	"R"	"R Square"	"Adjusted R Square"	"Std. Error of the Estimate"
1	.778a	.605	.600	.56841
a. Predictors: (Constant), AI Based Product Recommendations, Personalized shopping experiences, Convenient and Instant Interaction and Chatbots				

The model explained 60% of the variance with R Square value 0.605.

Table 8: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	162.914	4	40.729	126.057	.000[b]
	Residual	106.298	329	.323		
	Total	269.213	333			
DV: Overall, I am satisfied with my shopping from an AI enabled Retailer.						
b. Predictors: (Constant), AI Based Product Recommendations, Personalized shopping experiences, Convenient and Instant Interaction and Chatbots						

The significance value is less than 0.05 (0.000), which reflects that one of more of the IDVs significantly influences the DV (Table 8).

Table 9: Coefficients Results of Hypotheses Testing

Predictors	B*	Std. B*	Sig.	Results of Hypotheses Testing
(Constant)	3.847		.000	----
AI Based Product Recommendations	.092	.103	.003	Supported
Personalized shopping experiences	.684	.761	.000	Supported
Convenient	.093	.103	.003	Supported
Instant Interaction and Chatbots	.062	.069	.047	Supported

Table 9 shows that all the factors namely AI Based Product Recommendations, Personalized shopping experiences, Convenient and Instant Interaction and Chatbots have significant impact on "Overall, I am satisfied with my shopping from an AI enabled Retailer". The table also shows that the highest impact is shown by Personalized shopping experiences with beta value .761 followed by AI Based Product Recommendations and Convenient with beta value .103 and Instant Interaction and Chatbots with beta value .069.

Conclusion

AI has acted as a catalyst in online businesses. It has become an essence for businesses to compel consumers to have a seamless experience in whatever purchase they make online. It assists organizations with understanding the customers better, changing the business patterns or proposals, further developing their operational activities, and making the process more meaningful and hassle-free. The paper has showcased different facts which reveal that AI has substantially added so much more value to businesses. Simulated intelligence innovation is one big thing that is turning out to be more adaptable and versatile to human idea designs. In the e-retail domain, AI has shown a greater scope to retailers for encouraging more participation in the e-commerce business. With the assistance of AI, retail organizations can make their products more visual to their segmented customers as they realize what else they can look for on their commercial platforms. Customized experience catering to the customers is quite possibly the most regular justification for why eCommerce business applies AI. It assists organizations with profoundly segregating the customers' information and finding useful insights and the way in which they connect with the brand, making brand-to-customer correspondence more customized (Chui, et al., 2018).

Accordingly, advertisers can improve their cooperation with their customers, by utilizing different methodologies. This can be done via an email with exceptional coupons, wishes on their birthday celebrations, and exciting information related to discounts and offers on different products which the buyers decide to purchase. Artificial Intelligence has advanced to where it has turned into a fundamental part of the eCommerce business. Considering this propelling pattern, numerous eCommerce organizations have started to involve various types of software working on AI for understanding their customer's buying purchasing behavior, offering pertinent items with impeccable timing, and distinguishing techniques by empowering evaluation methods based on AI. The AI technology-based intelligence Chatbots, Superior User

Experience, eCommerce Catalog Management, and Automated Pricing Management are a portion of the indispensable employments of AI in the e-retail business, as examined in the paper. To add to that, the worldwide eCommerce market is at an unsurpassed value in the modern technological world because of superior technologies like Artificial Intelligence. While eCommerce organizations are confronting these market difficulties, AI acquires the best outcomes for business tasks (Mishra & Tripathi, 2021). For contending with top eCommerce organizations like Amazon and Flipkart, the competing firms ought to take on AI in eCommerce business processes at the earliest opportunity. There is an assortment of methods of how AI can reinforce business-client associations. It simply needs to examine the existing inflow of information and give organizations conceivable improvement designs. AI has an expansive execution in eCommerce. It assists organizations with customizing their product line according to the responses received by customers, working on their internal work processes, and making brilliant pathbreaking ways the most proficient method to astonish and fulfill their purposes. Subsequently, e-retail organizations can keep a strategic advantage on the lookout, draw in more customers as they grow, and enjoy an expanded income inflow.

The study was conducted to know the factors that determine the Role of AI in transforming the E-retailing Business and the impact of AI-enabled Retailer on overall satisfaction with shopping online consumers and found that AI Based Product Recommendations, Personalized shopping experiences, Convenient Instant Interaction and Chatbots and Customer Satisfaction are the factors that show the significant impact of AI-enabled Retailer on overall satisfaction with shopping of online consumers.

References

1. Alimo, P. K. & Zhao, Z. Y. (2018). The Impact of E-Commerce on Express Delivery Services in China: An Employment Prospect for Ghana. *International Journal of Scientific & Technology Research,* 7(12), 132-136. https://www.ijstr.org/final-print/dec2018/The-Impact-Of-E-commerce-On-Express-Delivery-Services-InChinaAnEmploymentProspect-For-Ghana.pdf

2. Appel, G., Grewal, L., Hadi, R. & Stephen, A. T. (2020). The Future of social media In Marketing. *Journal Of the Academy of Marketing Science*, 48(1),79-95. https://doi.org/10.1007/s11747-019-00695-1

3. Chan, J. O. P. (2020). Digital Transformation in The Era of Big Data and Cloud Computing. I*nternational Journal of Intelligent Information Systems*, 9(3),16-23, doi: 10.11648/j.ijiis.20200903.11.

4. Chui, M. (2017). Artificial Intelligence the Next Digital Frontier. *Mckinsey And Company Global Institute*, 47(3.6).

5. Chui, M., Manyika, J. & Miremadi, M. (2018). What AI Can and Can't Do (Yet) For Your Business. *Mckinsey Quarterly*, 1, 97-108.

6. Dash, R., Mcmurtrey, M., Rebman, C. & Kar, U. K. (2019). Application Of Artificial Intelligence in Automation of Supply Chain Management. *Journal of Strategic Innovation and   Sustainability*, 14(3),43-53. https://www.researchgate.net/publication/334749440_Application_of_Artificial_Intelligence_in_Automation_of_Supply_Chain_Management

7. 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(1), 24-42. https://doi.org/10.1007/s11747-019-00696-0

8. Demchuk, A., Rusyn, B., Pohreliuk, L., Gozhyj, A., Kalinina, I., Chyrun, L. & Antonyuk, N. (2019). Commercial Content Distribution System Based on Neural Network and Machine   Learning. *ICTES*,40-57. https://www.semanticscholar.org/paper/CommercialContentDistributionSystemBasedonandDemchukRusyn/3a2fda681b28cf82e1607ba8d91d65441cf4f9fa

9. Dirgantari, P. D., Hidayat, Y. M., Machmud, A. & Fachrulamry, D. M. R. (2020). Intention To Use Mobile Commerce in Indonesia with Technology Acceptance Model Approach. *Journal Of Engineering Science and Technology*, 15(6), 4171-4181. https://jestec.taylors.edu.my/Vol%2015%20issue%206%20December%202020/15_6_43.pdf

10. Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., Carlson, J., Filieri, R., Jacobson, J, ...& Wang, Y. (2021). Setting The Future of Digital and Social Media Marketing Research: Perspectives and Research

Propositions. *International Journal of Information Management*, 59, 102168. https://doi.org/10.1016/j.ijinfomgt.2020.102168

11. Fenwick, M., Mccahery, J. A. & Vermeulen, E. P. (2019). The End Of 'Corporate' governance: Hello 'Platform' governance. *European Business Organization Law Review*, 20(1), 171-199.

12. Fortuna, F., Risso, M. & Musso, F. (2021). Omnichannelling And the Predominance of Big Retailers in The Post-Covid Era. *Symphonya. Emerging Issues in Management*, (2), 142-157. https://doi.org/10.4468/2021.2.11fortuna.risso.musso

13. Fountaine, T., Mccarthy, B. & Saleh, T. (2019). Building The AI-Powered Organization. *Harvard Business Review*, 97(4), 62-73.

14. Guven, H., Guven, E. T. A. & Akkaya, B (2016). The Status of The Retail Sector During and After the Covid-19 Outbreak: What Should Strategic Managers Do? *Emerging Trends and Strategies for Industry 4.0: During and Beyond Covid-19*, 47.

15. Hussain, M. A., Ahsan, K., Iqbal, S., Nadeem, A. & Sarim, M. (2016). Assisting Disabled Persons in Online Shopping: A Knowledge-Based Process Model. *Journal Of Basic & Applied Sciences*, 12,23-31.

16. Kumar, V. & Garg, M. L. (2018). Predictive Analytics: A Review of Trends and Techniques. *Int. J. Comput. Appl*, 182(1), 31-37. DOI:10.5120/ijca2018917434

17. Lee, H. (2014). Paging Dr. Watson: IBM's Watson Supercomputer Now Being Used in Healthcare. *Journal Of AHIMA*, 85(5), 44-47. https://pubmed.ncbi.nlm.nih.gov/24938035/

18. Lee, S. B. (2020). Chatbots And Communication: The Growing Role of Artificial Intelligence in Addressing and Shaping Customer Needs. *Business Communication Research and Practice*, 3(2), 103-111. DOI:10.22682/bcrp.2020.3.2.103

19. Liu, C., Liu, X., Wu, F., Xie, M., Feng, Y. & Hu, C. (2018). Using Artificial Intelligence (Watson for Oncology) For Treatment Recommendations Amongst Chinese Patients with Lung Cancer: Feasibility Study. *Journal Of Medical Internet Research*, 20(9), E11087, doi: 10.2196/11087

20. Mahalakshmi, P. & Kathiravan, C. (2019). Exploring The Impulse Buying Behaviour Of E-Retail Business Environment in Current Scenario. *Journal Of Research Trends in Management*, 141-146. https://www.researchgate.net/publication/332697340_EXPLORING_THE_IMPULSE_BUYING_BEHAVIOUR_OF_ERETAIL_BUSINESS_ENVIRONMENT_IN_CURRENT_SCENARIO

21. Maia, E. H. B., Assis, L. C., De Oliveira, T. A., Da Silva, A. M. & Taranto, A. G. (2020). Structure-Based Virtual Screening: From Classical to Artificial Intelligence. *Frontiers In Chemistry*, 8, 343. https://doi.org/10.3389/fchem.2020.00343

22. Michiels, E. (2017). Modelling Chatbots with A Cognitive System Allows for A Differentiating User Experience. In *Poem Doctoral Consortium*, 70-78.

23. Mishra, S. & Tripathi, A. R. (2021). AI Business Model: An Integrative Business Approach. *Journal Of Innovation and Entrepreneurship*, 10(1), 1-21. DOI:10.1186/s13731-021-00157-5

24. Ng, A. (2016). What Artificial Intelligence Can and Can't Do Right Now. *Harvard Business Review*, 9(11).

25. Nigam, A. (2016). Website Quality and Consumer Online Purchase Intention of Railway Tickets in India. *International Journal of Engineering, Management, Humanities, And Social Sciences Paradigms (IJEMHS)*, 20(1), 1-8. https://www.ijemhs.com/Published%20Paper/Volume%2020/Issue%2001/IJES%2001/IJEMHSApril2016_1_8_Nigam.pdf

26. Niraj, S. & Nageswara Rao, S. V. (2015). Sustainability Of E-Retail in India. *Journal Of Internet Banking & Commerce*, 20(2). DOI:10.4172/1204-5357.1000107

27. Okuda, T. & Shoda, S. (2018). AI-Based Chatbot Service for Financial Industry. *Fujitsu Scientific and Technical Journal*, 54(2), 4-8. https://www.researchgate.net/publication/324644313_AIbased_chatbot_service_for_financial_industry

28. Omonedo, P., & Bocij, P. (2014). E-Commerce Versus M-Commerce: Where Is the Dividing Line. *International Journal of Social, Behavioural, Educational, Business and Industrial Engineering*, 8(11), 3610-3615.

29. Panch, T., Szolovits, P. & Atun, R. (2018). Artificial Intelligence, Machine Learning and Health Systems. *Journal Of Global Health*, 8(2). doi: 10.7189/jogh.08.020303

30. Pandey, A. C., Jamwal, M. & Soodan, V. (2014). Transforming Physical to Digital Marketplace-E-Retail: An Indian Perspective. *International Journal of Research in Management*, 4(4),11-18. https://www.researchgate.net/publication/264155245_Transforming_physical_to_digital_marketplace-E-retail_An_Indian_Perspective

31. Pantelimon, F. V., Georgescu, T. M. & Posedaru, B. Ş. (2020). The Impact of Mobile E-Commerce on Gdp: A Comparative Analysis Between Romania and Germany and How Covid-19 Influences the E-Commerce Activity Worldwide. *Informatica Economica*, 24(2), 27-41. DOI:10.24818/issn14531305/24.2.2020.03

32. Rabah, K. (2018). Convergence Of AI, IoT, Big Data and Blockchain: A Review. *The Lake Institute Journal*, 1(1), 1-18. https://fardapaper.ir/mohavaha/uploads/2018/06/Fardapaper-Convergence-of-AI-IoT-Big-Data-and-Blockchain-A-Review.pdf

33. Rampersad, G. (2020). Robot Will Take Your Job: Innovation for An Era of Artificial Intelligence. *Journal Of Business Research*, 116, 68-74. https://doi.org/10.1016/j.jbusres.2020.05.019

34. Roggeveen, A. L., Grewal, D., Karsberg, J., Noble, S. M., Nordfält, J., Patrick, V. M., ... & Olson, R. (2021). Forging Meaningful Consumer-Brand Relationships Through Creative Merchandise Offerings and Innovative Merchandising Strategies. *Journal Of Retailing*, 97(1), 81-98. DOI: 10.1016/j.jretai.2020.11.006

35. Sahoo, S. R. (2016). From Retail To E-Tail: The Transformation and Future. *India: IJCMR*, 2(9),69-71. https://www.researchgate.net/publication/330261822_From_retail_to_Etail_The_transformation_and_future

36. Saleem, H., Muhammad, K. B., Nizamani, A. H., Saleem, S., & Aslam, A. M. (2019). Data Science and Machine Learning Approach to Improve E-Commerce Sales Performance on Social Web. *International Journal of Computer Science and Network Security (IJCSNS)*, 19.

37. Satnalika, N. & Rao, S. V. D. N. (2016). Sustainability Of E-Retail in India. *Indian J. Econ. Bus*, (3), 349-363. https://www.researchgate.net/publication/286861819_Sustainability_of_e-retail_in_India

38. Singh, A. (2016). Impact Of Mobile Commerce in E-Commerce in Perspective of Indian Scenario. *Asian Journal of Technology and Management Research (AJTMR),* 6(02). http://www.ajtmr.com/papers/Vol6Issue2/Vol6Iss2_P1.pdf

39. Singh, A., Ganapathysubramanian, B., Singh, A. K. & Sarkar, S. (2016). Machine Learning for High-Throughput Stress Phenotyping in Plants. *Trends In Plant Science*, 21(2), 110-124. doi: 10.1016/j.tplants.2015.10.015

40. Štefko, R., Bačík, R., Fedorko, R., Oleárová, M. & Rigelský, M. (2019). Analysis Of Consumer Preferences Related to The Use of Digital Devices in The E-Commerce Dimension. *Entrepreneurship And Sustainability Issues*, 7(1), 25. https://doi.org/10.9770/jesi.2019.7.1(2)

41. Tou, Y., Watanabe, C., Moriya, K., Naveed, N., Vurpillat, V. & Neittaanmäki, P. (2019). The Transformation Of R&D Into Neo-Open Innovation-A New Concept In R&D Endeavor Triggered by Amazon. *Technology In Society*, 58, 101141. https://doi.org/10.1016/j.techsoc.2019.05.005

42. Yablonsky, S. (2019). Multidimensional Data-Driven Artificial Intelligence Innovation. *Technology Innovation Management Review*, 9(12), 16-28. DOI:10.22215/timreview/1288

43. Daowd, A., Hasan, R., Eldabi, T., Rafi-ul-Shan, P. M., Cao, D. & Kasemsarn, N. (2020). Factors affecting eWOM credibility, information adoption and purchase intention on Generation Y: A case from Thailand. Journal of Enterprise Information Management. https://dx.doi.org/ 10.1108/JEIM-04-2019-0118

44. Sardar, A., Manzoor, A., Shaikh, K. A. & Ali, L. (2021). An empirical examination of the impact of eWom information on young consumers' online purchase intention: Mediating role of eWom information adoption. SAGE Open, 11(4), 21582440211052547. DOI:10.1177/21582440211052547

45. Chawla, D., Sondhi, N. (2011). Research Methodology: Concepts and Cases, Vikas Publishing House Pvt. Ltd, New Delhi, India.

46. Malhotra, N. K. (2007). Marketing research: An applied orientation. Upper Saddle River, NJ: Pearson/Prentice Hall.

47. Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). Multivariate data analysis 6th Edition. Pearson Prentice Hall. New Jersey. humans: Critique and reformulation. Journal of Abnormal Psychology, 87, 49-74.

48. Klein, K., & Martinez, L. F. (2022). The impact of anthropomorphism on customer satisfaction in Chatbot Commerce: An experimental study in the food sector. Electronic Commerce Research. doi:10.1007/s10660-022-09562-8

49. Green, S.B. (1991). How many subjects does it take to do a regression analysis? Multivariate
50. Behavioral Research, 1991, 26, 499-510
51. Burmeister, E., & Aitken, L. M. (2012). Sample size: how many is enough? Australian critical care: official journal of the Confederation of Australian Critical Care Nurses, 25(4), 271–274. https://doi.org/10.1016/j.aucc.2012.07.002