

The impact of Artificial Intelligence on Consumer Behaviors An Applied Study on the Online Retailing Sector in Egypt

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Abstract

This paper aims to investigate the impact of Artificial Intelligence (AI) on consumer behaviors within the retailing sector in Egypt. The research depended on the quantitative research method. The primary data was collected through the online questionnaire. Convenience sampling was used. The sample size in this research is 400. A total of 384 responses were collected and valid. The data was analyzed using the Statistical Package for the Social Science (IBM SPSS v22) for Windows computer software. The Results highlighted that there is a significant relationship between Artificial Intelligence and consumer behavior. In addition, The model has a high ability to predict and explain the consumer purchase behavior through Artificial Intelligence, and this was proved by the validity of the first hypothesis (H1) through the value of (R-Sq = 0.95.8) in the model. The study recommends online retailers to employ Artificial Intelligence in each step in the consumer journey, from need recognition, information search, evaluation, and purchase decision making to post-purchase behavior to predict consumer's purchase behavior in the online platform.

Keywords: Artificial Intelligence, AI, AI in Marketing, Consumer Behaviors, Online Retailers, Consumer Journey, Big Data, Machine Learning, Deep Learning, Algorithms.

1.Introduction

1.1Background

The digital transformation of retail activities becomes a condition to compete in dynamic markets; these technologies have several implications for marketing activities to make their performance better. One of these technologies is Artificial Intelligence (AI) that enables marketers to better understanding and targeting consumers and customizing marketing action. AI provides marketers with new tactics and tools, which help them to achieve their goals; AI presents advantages to consumers, marketers, and society as a whole through improving the creation, optimization, and distribution of value. It is expected by 2030, AI will contribute to the global economy with \$15 trillion (PwC, 2017). In recent years, AI becomes an emerging trend in many different fields; marketing is one of these fields. AI radically changes the nature of marketing; AI entails significant changes in the way that consumers interact with companies. Therefore, marketers need to prepare themselves for the changes that come in the era of Artificial Intelligence; Learning about the effect of AI on marketing becomes crucial. On the other hand, the depths research about the impact of Artificial Intelligence on consumer behaviors stile rare, which hinder marketers to apply such technology. There is a need for marketers to understand how they can use AI in their marketing activities and functions to predict and change consumer behavior along the consumer journey, from need recognition, information search, evaluation, and purchase decision making, to post-purchase behavior.

1.1.1. Research Problem

The current research is concerned with answering a specified question and fills in a specific gap "does Artificial Intelligence affect customers' purchase behavior in the context of the online retailing sector? And do customers follow recommendations from AI systems implemented in the retailers they deal with while purchasing?"

1.1.2. Research Questions

A. Is there a relationship between Artificial intelligence and consumers' purchase behavior?

B. Are there significant differences in customers' purchase behavior based on their demographics (gender, age, educational level, and annual income)?

1.1.3. Research Objectives

A. To investigate the relationship between Artificial intelligence and consumers' purchase behavior?

B. To find out the differences between customers' purchase behavior based on their demographics (gender, age, educational level, and annual income).

2. Literature review.

1.2 Artificial intelligence (AI)

AI is related to computers with capabilities that can think and act more efficiently than humans do, such as image recognition, voice recognition, decision making, and translation between languages (CXP, 2018). Sterne (2017) declares that AI can do what is known by "three Ds"; detect, decide, and develop. Detect refers to the ability of AI to identify the most expected and predominant characteristics in a subject matter. AI can determine which characteristics would be preferable, and which to ignore. Decide refers to the ability of AI to decide a decision after evaluating a huge number of characteristics, and then determines the most important one of them. Develop refers to the power that AI has to program itself by taking into account the new data and the analysis of research along with how it evaluates each factor, then modify its view.

AI is a computerized system, which employs data to perform tasks of human beings, in a way that maximizes their chances of success. Data or more specifically Big Data is the hugest part of AI; Big Data is the term represents the analytical methods and schemes that exploit the data gathered by companies when they are online with their customers around the world. Big Data is the historical results collected from the internet, and the main

characteristics of it are high volume, speed, and diversity (Chaffey & Ellis-Chadwick, 2019). AI deals with the 2 types of big data that are structured and unstructured data. Structured data is the traditional datasets like demographics, records of the transaction, and history of web-browsing, AI can process such type of data through the complex computations and provide accurate results in real-time, such data can be easily organized in the spreadsheet (Kietzmann, 2018). While most of the daily generated consumers data are unstructured data, it is more complicated, and it should be managed to present intelligible results that can't be presented in the form of spreadsheets (Sponder & Khan, 2018)

AI is a portfolio of technologies that are designed at three different levels to perform tasks in a way similar to human beings in computers. The most common form of AI is Artificial Narrow Intelligence (ANI); it appears in our day-to-day lives. ANI is capable to perform specific tasks, the computer was taught before. These tasks are related to human cognitive abilities such as image recognition, predictive analysis, and segmenting customers. For instance, Zalando relays on the history of customers' orders to suggest them new ones. The second level is Artificial General Intelligence (AGI), which can exceed human intelligence in many different fields. AI can think plot, and solve problems independently. Visual recognition, language processing, voice recognition, intelligent computing, and robotics are examples of AGI. Artificial superintelligence (ASI) is the third level of AI, it exceeds human intelligence in every field, through creative and scientific thinking, but it does not exist yet, because we know little about human nature and the brain. No one can imagine the consequences when this level emerged; it can abolish people from the world (Sterne 2017; Kaplan & Haenlein, 2019).

According to Jarek & Mazurek (2019) AI has five areas; some of them are so popular in marketing, such as voice recognition, image recognition, text recognition, and decision-making, while autonomous robots and vehicles are widely used in Industry. Voice recognition depends on simple neural network software to

recognize voices; it will change the interaction between consumers and brands. The integrated voice recognition technology can understand what the customer says and means (Dash, 2015). For instance, Amazon Echo integrated Alexa, which is an e-commerce voice AI, it facilitates consumers to purchase through speaking to the machine, it enables Amazon to gain 70% of the smart speaker market (Avinaash, 2018). Text Recognition is a type of interactive AI, such as Alpine AI, the virtual assistant, which guides customers in their walk in the shopping center. Image Recognition helps marketers to understand consumer behavior, through analyzing videos or pictures that people share on social media. Marketers can recognize the consumption details of consumers, through their comments about the displayed offers in images (Forsyth and Ponce, 2011). In the Decision-Making, Albert AI and Harley Davidson are capable to manage online marketing campaigns, where both apps analyze the data generated after publishing the campaign and suggest recommendations related to this campaign. Autonomous Robots such as Schnuck can check shelves on the shops to check the stock, and the order of the displayed products, and then send such information to the service staff to do their jobs (Jarek & Mazurek, 2019).

1.2. Artificial intelligence (AI), Machine Learning (ML), and Deep Learning (DL)

Machine learning is a subset of AI, which is widely used in marketing. Computer programs or algorithms are used to teach Machine learning systems how to find the correct output from a given input, and then continually improve upon themselves, as more data are processed. Well-trained machine learning algorithms carry many advantages to companies. They can perform tasks that humans do, which makes such algorithms cheaper and reliable assets than employees for the marketing department. The most common algorithms that are used to teach ML are supervised learning, unsupervised learning, Semi-supervised Learning, and reinforcement learning (Sterne, 2017).

Therefore, machine learning is vital for AI. It is impossible for any automated system like AI, to exist in an unpredictable environment without having the power to learn and explore the world, as humans do (Alpaydin, 2016).

Deep learning is a subset of machine learning (ML). It depends on the neural networks that are similar to the human brains to analyze data in a non-linear way by using an effective way of unsupervised learning. Therefore, deep learning becomes more and more practical, with the advancement of computing power, especially the advancement of graphics processing units (GPUs) (Sterne, 2017). Deep learning can help AI tools such as profiling, automation, augmentation of tasks, and customization. These tools are based on the generated information from the big data analysis and then providing different interaction opportunities between customers and brands. For instance, in retail shops, deep learning depends on the result of profiling and the data mining to enhance the scheduling and task assignment, which helped in managing retail shop's staff more efficiently and providing a satisfactory service for the customers (Daugherty & Wilson, 2018). Indeed, the technologies of AI such as natural language processing, machine learning, and deep learning, will help AI to dominate the marketing field (Avinaash, 2018).

2.3.The impact of Artificial intelligence (AI) on Marketing

AI plays a dominant role in B2c and B2b marketing. The report conducted by KRC Research declared that AI has a significant impact on marketing better than social media, and it will help brands to create a better customer experience, and more personalized interaction through Chabot. Also, The Forrester study conducted by Emarsys on 717 marketers, mentioned that 79% of surveyed marketers thought AI makes the workflow more strategic than before (Avinaash, 2018). Jarek & Mazurek (2019) revealed that AI plays a significant role in marketing activity. The impact of AI appears clearly in the retailing sector, which is characterized by frequent contact with customers, which

produces a large amount of data about customer attributes and transactions. AI analyzes these data and provides personalized recommendations for the customers in real-time. AI tools, in terms of natural language processing (NLP), predictive analytics, and algorithms can play a meaningful role in extracting insights from the brand data, concerning user context, and Quill is a perfect example (Avinaash, 2018). Therefore, AI is the technology that will be adopted by marketers because it will affect the face of retailers' marketing strategies and customer behaviors (Davenport et al., 2020).

AI brought a whole spectrum of advantages to consumers, such as shorter and convenient shopping time, which was a result of the improved processes like automatic payments, the better quality of search engines, 24/7 customer service. AI provides the consumer with a new experience, through automatic recommendations and pertinent product suggestions, the customer service personalization, and after-sales service. Besides, AI improved the relationship between consumer and the brand, AI gives the consumers the chance to test the product virtually. Indeed, most of the customers think that AI will make life better by solving complex problems, while others see that AI will take their jobs away (PwC, 2017).

1.2.The impact of Artificial intelligence (AI) on Consumer Purchase Behavior

The consumer purchase behavior process is the process of physical activity and decisions making that customers engage in to get, use, and dispose of goods and services that satisfy their needs and wants. The analysis of such a process can help in predicting future behavior (Qazzafi, 2019). The consumer purchase decision-making process consists of five stages; needs recognition, information search, evaluation of alternatives, purchase decision, and post-purchase behavior, they reflect the stages that consumers pass through their journeys before deciding product possession. Consumers can skip one or more stages. It depends on their mind (Kotler et al., 2017).

Consumer purchase behavior is not easy to be understood, because it is related to the human mind, while in the context of the digital platform, it is possible through AI, which can help in analyzing and predicting consumer purchase behavior. In the digital platform, consumers show their needs, wants, and attitudes in different forms like search, comments, blogs, Tweets, likes, videos, and conversations, through several channels like web, mobile, or face-to-face (Court, et al., 2009). Therefore, the supply of consumers' data is continuously growing in its volume, speed, variety, and accuracy. AI can play a role in turning such a flow of data into meaningful consumer insight (Kietzmann, 2018). The insights on consumer purchase behavior are the base that marketers depend on, to decide on marketing tactics, and predict sales. AI depends on such insights to recommend retailers about product displays and cataloging (Avinaash, 2018). Therefore, understanding the consumer journey is very important; AI can help marketers to understand and reach consumers at many stages of the consumer journey (Kietzmann, 2018). To understand how AI affects consumer purchase behavior, it is necessary to understand the significant role that AI can play in each stage of the consumer journey.

1.2.1. Need and Want Recognition

Need recognition is the first step in the consumer journey. Companies should determine consumers' needs and create marketing strategies, which can satisfy these needs (Kotler et al., 2017). A person's needs are trigger on categorizes not brands (Batra and Keller, 2016). Therefore, it is not easy to track someone's needs and wants.

AI can understand consumers' emerging needs and wants when consumers express them online. AI will help marketers to build richer consumers' profiles faster and in real-time. The digital footprints of consumers are always developed through consumer's online behavior, such as status updates on social media, online purchases, comments, and posts of consumers, and then Machine learning updates consumers' profiles automatically. For instance, Microsoft's AI system Azure helped the media company Astr in building consumer profiles by analyzing billions of data points, and determines consumers' needs in seconds, and then personalizes web

content in a way that suits consumers' interests. Furthermore, AI helps marketers to facilitate needs and wants recognition. For instance, Pinterest uses image recognition to determine consumers' particular style preferences based on the image they pin on the site, and then the site manifests the images to the users that are relevant to them (Kietzmann, 2018). Besides, the personalized modeling that was developed by AI-implemented Adobe Audience Manager, helped in targeting consumers that have similar profiles and interests of the current users (Michael, 2010).

Davenport et al. (2020) mentioned that online retailers assume that AI can predict customers' needs and wants, and these predictions have a high accuracy. Therefore, some online retailers shifted to a shipping-then-shopping business model, when they depended on AI to identify the preferences of customers and ship these items without a formal order from customers, who are free to buy, or return items they do not need, where customers place orders after they receive the shipped products (Agrawal et al., 2018). Amazon is a perfect example when applied to Anticipatory Shipping, once it anticipated the order of customers; it sends products to the nearest delivery center (Avinaash, 2018). This shift in the business model could change retailers' marketing strategies and customer behaviors. Therefore, in the need recognition stage, AI can understand customers' emerging needs and wants, and then suggests the appropriate recommendations in the context of the online retailing.

1.1.3.Information Search

The next step in the consumer journey is the information search. It starts after consumers recognize their needs. Then they begin to deliberate the possible offerings to satisfy their needs and wants. The role of marketers is to make their brands in the consideration set of consumers. Therefore, marketers use the advertisement to increase the visibility of their brands, and to communicate the key reasons for consideration, through search optimization, paid search advertisement, organic search advertisement retargeting (Batra and Keller, 2016).

It appears that AI will lead to another industrial revolution, and winners will be those who adapted earlier to AI. The survey

conducted by Gartner revealed that the adaptors of AI, who adapted their website to support voice and visual search, will gain more than a 30 % increase in their digital commerce revenue by 2021(Avinaash, 2018).

AI-powered search can help marketers to represent the ideal results to the consumers in real-time, through identifying, ranking, and presenting the results the consumers searched. For example, in 2017, the e-commerce sales of The Works, the leading discount retailer, has increased by 37%, after implementing Rich Relevance, an AI-powered, which personalized online search functionality to its website. In addition, the recent platform of Google can anticipate the information that customer searches for (Avinaash, 2018).

Deep learning can analyze consumer behavior and predicting users' trends, then serving ads through a recommendation engine. For instance, 'CHINESE GOOGLE' achieves tremendous revenue by targeting ads by AI. AI and machine learning enhance the possibilities a customer will click a product, which can be a benefit in optimizing the display of the product mix, especially when retargeting or using ad copy as per demographics (Avinaash, 2018).

For trend marketers, AI has become necessary, AI can help them in many different ways, such as targeting customers more effectively than before, and providing personalized communication for them (Avinaash, 2018). For instance, Google Adwords provides marketers with qualified leads for better targeting. AI helps Google to analyze search query data in terms of keywords, phrases, context words, consumers' activity data, and many other big data, to determine the most valuable subset of consumers. For instance, AI helped Zendesk, a customer service software company, to get a high-quality volume of leads through building richer consumers' profiles and presenting advertisements to the users of Facebook, who match such profiles (Batra and Keller, 2016).

In other words, companies will not be able to stabilize their positioning in a competitive environment if they are not able to

score and generate new leads. The appropriate integration with machine learning can be resulted in identifying lead, with the highest probability for conversion. Integrating AI with a precision search tool will help in analyzing the raw information and identifying the potential leads. For instance, the sales productivity app that is called Cien applied AI achieved more lead scoring and accelerated sales cycles (Avinaash, 2018). Another example, Salesforce Einstein, it includes some additional tools, which can suggest the lead score that should be tracked first. It works through collecting data automatically when synchronizing the email data and calendar with a record (Jason, 2017).

Therefore, in the information search stage, AI can provide the customers with the information they need, then gives them the possible offerings that satisfy their needs and wants in the context of online retailing.

1.1.3.Evaluation

The third step in the consumer journey is the evaluation of alternatives. It starts after getting the information about the product that consumers intend to acquire. Consumers make a comparison between different brands and evaluate them by ranking each one (Kotler et al., 2017). When consumers decide the probability list of brands they intend to buy from, marketers use relevant content to convince the consumer to trust their offerings, and these offerings are the best choice (Batra and Keller, 2016).

One advantage of integrating AI is content personalization. AI is a strategy, which depends on the prospects' data to create and deliver relevant content. This content suits the interests and preferences of those prospects. Indeed, any company can use such innovation for blog content creation. Website Personalization is another advantage of integrating AI. It is depicted as one-to-one marketing; it makes online shopping easier by presenting more personalized and relevant content that makes websites more useful and interesting, which encourages consumer engagement. Moreover, using AI algorithms and machine learning can provide incentives to the website's visitors. These incentives can

encourage their possibility of converting, and the AI platform that is called Personali is a good example (Avinaash, 2018).

Content personalization comes from the analysis of the buying and browsing behaviors, such as website clicked views, or path, the reviews of the product, the followers, and their likes to social media. Gathered data can suggest marketers' recommendations for content creation based on customers' preferences in terms of images, colors, etc (Sterne, 2017). Besides, marketers can create emails, and posts on Facebook, which suit the liking of each customer. Therefore, AI-powered content creation helps professional marketers to obtain their marketing objectives through the creation of smart content (Chaffey & Ellis-Chadwick 2019). Further, producing content for different products and services consumes a lot of time and money, but AI can introduce personalized content at an effective cost. For instance, APIs' ecosystem in terms of cloud-based systems and open-source software, helped in providing a more personalized marketing campaign at an effective cost (Avinaash, 2018).

In the consumer journey (via lead scoring), it is easy to determine the ideal style of content that encourages prospects to engage. Rocco is an AI-powered tool that can recommend novel content, which can engage the brand's followers on social media platforms (Avinaash, 2018). Therefore, in the evaluation stage, AI can help marketers in specific tasks, such as targeting consumers who have high purchase intentions and then sending them the content that is reliable and persuasive. Besides, AI can help customers to know a lot about related products and provide them personalized recommendations in real-time.

1.1.4.Purchase Decision Making

The fourth step in the consumer journey is the purchase decision. It starts when consumers decide to buy a certain brand after evaluating the brands they ranked; in this stage consumers decide what and where to purchase the highest-ranked brand. On the other hand, the environment can influence consumers' purchase decisions (Kotler et al., 2017). Once the consumers start to decline that their brands are

the best, and they are willing to pay. Marketers should move them from the decision process to take purchase action by focusing on the value of the brand among competitors (Batra and Keller, 2016). such as the information about convenience and where to buy, guarantees, or return policies and offering purchase incentives. Staples, the office-supply retailer, its intelligent purchasing system makes it easy for consumers to place orders in many different forms, such as voice commands, text, or e-mail (Avinaash, 2018). Companies that adopted AI have gained an increase in user leads. Therefore, AI can alter the process of purchase completely.

AI becomes popular in the business world, even in the areas that are managed in particularly by individuals such as the sales department; AI-analytics can help such departments in doing their jobs more effectively and smartly. Several AI-driven sales software is proved to be effective, such as Nudge, which enables the sales team to engage each potential customer. Also, Chorus that helps them to record and transcribe on spot conversation. Also, the intelligent e-mail assistant called Conversica communicates them whenever the lead is ready for sales. Further, InsideSales helps them to improve its quota. Also, Tact, an AI-driven tool helps them to focus on closure sales rather than administrative work. Indeed, AI provides the salesperson with accurate prediction and Intelligent Recommendations through analyzing the past data and priorities leads that are likely to convert (Avinaash, 2018).

In the purchase decision-making stage, AI can suggest customers the best option for purchasing based on their needs. AI allows customers to place orders in many different forms, such as voice commands, text, or e-mail. Also, AI can optimize the chance of closing deals.

1.1.3. Post-purchase behaviors

The fifth step in the consumer journey is Post-purchase behaviors; it is related to consumer behavior after acquiring and using the selected brands or products. Companies have to get information about the opinions of consumers regarding their products. When

consumers are satisfied, they will retain and influence more other consumers, and the sales will increase, but if they are dissatisfied, the problems will arise (Kotler et al., 2017). Consumers usually explain their satisfaction or dissatisfaction and their intention to repurchase the brand through word of mouth. Therefore, Marketers should solve any aroused problem (Kietzmann and Canhoto, 2013) and respond to all leads queries.

AI can help companies to respond to all leads queries. AI-enabled "Chatbots" assist marketers to connect with consumers after the process of purchase. The software was developed by Autodesk. It relies on a virtual agent to respond 24/7 to all queries of consumers in 5 minutes. Chatbots are based on learning algorithms. It can learn from consumers' behavior and modify service accordingly through deep learning, which in turn helps marketers to connect with consumers in a new way (Daugherty & Wilson, 2018). Chatbots can assist a huge amount of information in seconds, and serve million of the customer at the same time. Therefore, In the post-purchase behaviors stage. AI can recognize any signs of dissatisfaction and taking the appropriate action to satisfy its customers.

In summary, AI has a significant role in each stage of the consumer journey. In the need recognition stage, AI can help marketers to build faster, accurate, and updated profiles of customers. Then, in the information search stage, AI can help marketers to determine the best leads for better targeting, provide the ideal suggestions for the customers, and determine the ideal style of content that suits customers' preferences. While in the evaluation stage, AI can target the customers with high purchase intentions, then sending them the persuasive content. In the purchase stage, AI can provide customers with intelligent purchasing systems that can make the purchase process easier than before and alert prices dynamically. Finally, in the stage of post-purchase behavior, AI can delight consumers and determine their value. AI helps marketers to predict and change consumer behavior during the consumer journey.

Therefore, the following hypotheses are proposed based on the above discussion:

H1: There are relationships between Artificial intelligence and consumers' purchase behavior.

H2: There are significant differences between customers' purchase behavior based on their demographics (Gender, Age, Educational Level, and Annual Income).

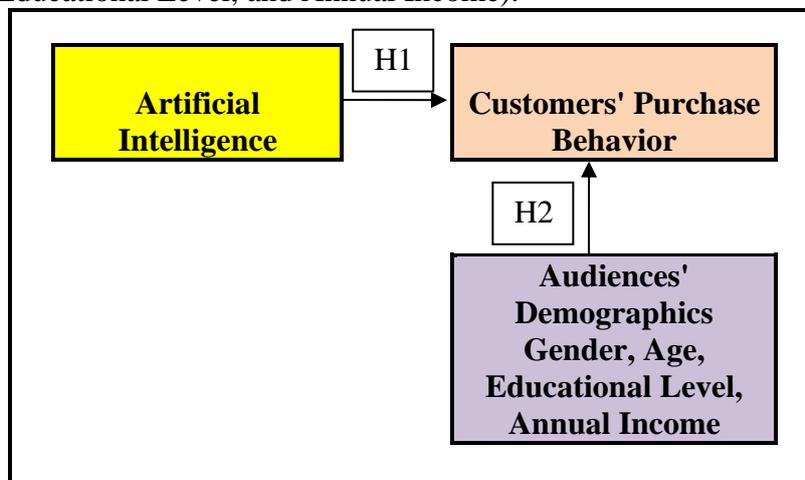


Figure 1: The Conceptual Framework of the Research

2. Method

To achieve the aforementioned research objectives, descriptive research was chosen as a research format. The research depended on the quantitative research method. The secondary data and primary data were used for data collection. The secondary data sources included books, journals, newspapers, and websites. Primary data was collected through the online questionnaire, which was developed to capture the impact of artificial intelligence on consumer behavior. The questionnaire was adapted from several literature reviews; the list consists of 10 items representing artificial intelligence and 8 items representing consumer behavior. These items were presented on a 5-point Likert-type scale, anchored from 1 (strongly disagree) to 5 (strongly agree). Non-probability sampling was manipulated as a

sampling method. Convenience sampling was used as a sampling technique. The sample size in the current research is 400 as recommended by Hair et al. (2014). The content validity and construct validity were conducted. The questionnaire also includes demographic characteristics. The questionnaire was distributed online in June 2020 to target consumers who have bought from the online retailers in Egypt within the past three months. A total of 384 responses were collected and valid. In an attempt to explore consumer behavior in association with the perception of the impacts of AI, descriptive analysis, Cronbach's alpha, Correlation analysis, one-way analysis of variance (ANOVA), The Mann-Whitney U Test, Kruskal Wallis One-Way Analysis of variance Test, and Structural equation modeling were implemented to analyze the data using the Statistical Package for the Social Science (IBM SPSS v22) for Windows computer software.

2. Results and discussion

2.1. Descriptive Analysis of the Sample

There is a relatively balanced distribution in terms of gender (54% male). Respondents are relatively older (51% are above 30), mostly college-educated (56% have a university degree), and about 60% have annual income less than 60,000 L.E.

2.2. Reliability Analysis

The reliability of each construct with its different number of statements can be measured by the Cronbach's alpha. In this model, 2 constructs are focused on.

Table 1: Reliability Test for Constructs

No.	constructs	Cronbach's alpha	N of Items
1	Artificial Intelligence	0.971	10
2	Consumer behavior	0.962	8

The results in Table 1 indicated that Artificial Intelligence and Consumer behavior have high-reliability coefficients (0.971) and (0.962) respectively. Therefore, the surveys are reliable because the Cronbach's alpha and the internal consistency based on the corrected correlations are more than 0.5 (Hair et al., 2014).

2.3. Correlation Analysis

Table 2: the Pearson Correlations between Constructs

	Artificial Intelligence	Consumer Behavior
Artificial Intelligence		
Sig. (2-tailed)		
Consumer behavior	0.979**	
Sig. (2-tailed)	0.000	

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

In Table 2, the variables are positively correlated with each other and there was a significant relationship between all constructs at 0.01 level in the model.

2.4. Regression Analysis

2.4.1. Testing the First Hypothesis H1

H1: There are relationships between Artificial intelligence and consumers' purchase behavior.

To test the validity of the first hypothesis (H1), a simple regression model was developed between consumer behavior as a dependent variable and Artificial Intelligence as independent variables.

Table 3: Analysis of Variance between Artificial Intelligence and Consumer behavior

Dependent Variable	Sum of Squares	df	Mean Square	F	P-value
	288.613	1	288.61	8726.07	
Consumer behavior	12.635	382	.033		0.000a
	301.248	383			

In Table 3, the model shows that there is a significant relationship between Artificial Intelligence and consumer behavior. The significant level is .000. The positive values show that there is a positive relationship. Besides, it is also confirmed through (F calculated = 8726.07), which is greater than (F tabulated = 3.021).

Table 4: Analysis of Simple Regression between Artificial Intelligence and Consumer behavior

Model	Unstandardized Coefficients		Standardized Coefficients	T	P-value
	B	Std. Error	Beta		
(Constant)	.102	.040		2.528	.012
Artificial Intelligence	.957	.010	.979	93.413	.000

In Table 4, the coefficient of the simple regression model of Artificial Intelligence proves the significance of the coefficient of the resource. The significant level is .000. It is also confirmed through (T calculated =93.413), which is greater than (T tabulated = 1.967).

The coefficient of determination R-Sq equals 0.958, which means the effect of Artificial Intelligence is 95.8 % in the variation of consumer behavior.

2.4.2. Testing the Second Hypothesis H2

H2: There are significant differences between customers' purchase behavior based on their demographics (gender, age, educational level, and annual income).

To test the validity of the second hypothesis (H2), the Mann-Whitney U test, and Kruskal Wallis One-Way Analysis of Variance Tests were used as non-parametric tests to compare differences between two independent groups. In this research, the Mann-Whitney U test was developed between the answers of the respondents regarding their purchase behavior based on their gender.

Table 5: Results of Analysis of Mann-Whitney Test for Customers' Purchase Behavior According to Gender

Variable	Gender		Mann-Whitney U	Wilcoxon W	Z	Sig*
	Male	Female				
	Mean Rank					
Customer's purchase behavior	131.5	264.6	5615	27351	-11.73	0.000

From Table 5, the value of Sig (0.000) < 0.05, which means reject the null hypothesis (HO: the two groups are equal), and accept the alternative hypothesis (H1: the two groups are not equal), and the two groups are significantly different. Therefore, the hypothesis

"There are significant differences in Customers' Purchase Behavior based on Customers' gender" is supported.

The Kruskal-Wallis H test (one-way ANOVA by ranks), an extension of the Mann-Whitney U test, is one of the nonparametric tests (equivalent to one-way analysis of variance) that are used to compare multiple independent samples. In the current study, The Kruskal-Wallis tests were used to assess the differences between the answers of the respondents regarding their purchase behavior as a dependent variable based on their age, educational level, and annual income (as independent variables).

Table 6: Results of Analysis of Kruskal-Wallis Test for Customer's purchase behavior according to Age

Variable	Age			(Chi-Square)	Df	Sig*
	From 18 to 24	from 25 to 29	30 or above			
Mean Rank						
Customer's purchase behavior	185.65	304.2	118.02	225.18	2	0.000

From Table 6, the value of Sig (=0.000) < 0.05, which means reject the null hypothesis (HO: the groups are equal), and accept the alternative hypothesis (H1: the groups are not equal), and the groups are significantly different. Therefore, the hypothesis "There are significant differences in customers' purchase behavior according to their Age" is supported.

Table 7: Results of Analysis of Kruskal-Wallis Test for Customer's purchase behavior according to Educational Level

Variable	Educational Level			(Chi-Square)	df	Sig*
	Pre-University/Certificate	a university degree	postgraduate degree			
Mean Rank						
Customer's purchase behavior	248.44	138.51	328.2	225.2	2	0.000

From Table 7, the value of Sig (=0.000) < 0.05, which means reject the null hypothesis (HO: the groups are equal), and accept

the alternative hypothesis (H1: the groups are not equal), and the groups are significantly different. Therefore, the hypothesis "There are significant differences between customers' purchase behavior according to Educational Level" is supported.

Table 8: Results of Analysis of Kruskal-Wallis Test for Customer's purchase behavior according to the annual income

Variable	Annual Income			(Chi-Square)	Df	Sig*
	Less than 60000	from 60000 to less than 80000	80000 or above			
	Mean Rank					
Customer's purchase behavior	151.5	287.56	174.86	112.37	2	0.000

From Table 8, the value of Sig (=0.000) < 0.05, which means reject the null hypothesis (HO: the groups are equal), and accept the alternative hypothesis (H1: the groups are not equal), and the groups are significantly different. Therefore, the hypothesis "There are significant differences in customers' purchase behavior according to their annual income" is supported.

2.5. Structural Equation Model Analysis for the Conceptual Model

To test the research hypotheses and the structural model prescribes the impact of Artificial Intelligence on consumer behaviors, and the interrelationships between constructs, the structural equation modeling (SEM) was conducted to determine whether the data fit the hypothesized model using the AMOS v22 program in this research. Confirming the structural relationship in a structural model can be done by using structural equation modeling (SEM). The properties of the research model are as follows: one construct, of which one was exogenous Artificial Intelligence and one endogenous consumer behavior.

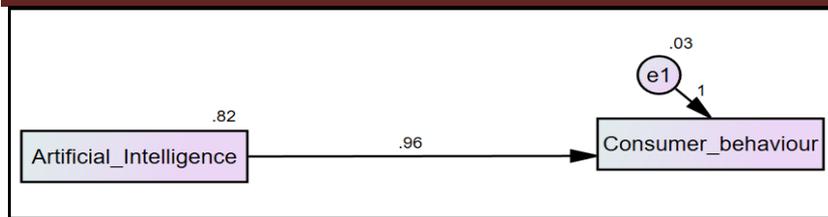


Figure 2: the Path Diagram for the Conceptual Model.

In Figure 2, the hypothesis is supported; the parameter estimate is significant and has the predicted sign (e.g., positive effect).

Table 9: Results of Structural Model Assessment

Hypotheses		Estimate	S. E	C. R	P	results
H1	Consumer behavior <--- Artificial Intelligence	.957	.010	93.54	***	supported

From Table 9, moving on to the parameter estimates representing the research hypothesis, the result suggests that the sign of associations between the constructs are in congruence with the hypothesized relationship. In addition, the path coefficient from Artificial Intelligence to Consumer behavior is 0.000 (p-value <0.05), which is statistically significant at the 0.05 level. This provides support for the validity of the two constructs forming the model, which means the hypothesis is supported and that Artificial Intelligence does have an effect on consumer behavior. As a result, the hypothesis H1 is accepted.

3. Conclusion

The digital transformation of retail activities becomes a condition to compete in dynamic markets. One of these technologies is Artificial Intelligence (AI) that enables marketers to better understanding and targeting consumers. AI radically changes the nature of marketing; AI entails significant changes in the way that consumers interact with companies. Therefore, marketers need to prepare themselves for the changes come in the era of Artificial Intelligence, marketers need to understand in-depth, how they can use AI in their marketing activities to predict and change consumer behavior along the consumer journey,

Therefore, this research aims to clarify the impact of Artificial

Intelligence on customers' purchase behavior in the online retailing sector, which helps online retailers to measure the extent to which customers follow recommendations from AI systems implemented in their retailers while purchasing. For that reason, the research provides an overview of the concept of Artificial Intelligence and its levels and areas. It sheds light on Machine Learning and Deep Learning, and the role of AI in marketing. Also, it presents the impact of AI on consumer purchase behavior, with a special focus on each stage of the consumer journey from need recognition, information search, evaluation, and purchase decision making to post-purchase behavior.

4. Main Findings

The structured model valid for use and has the following advantages:

- a) The reliability of all constructs of the model measured by Cronbach's alphas has higher degree rates from (0.972 to 0.962).
- b) All variables are positively correlated with each other, and there was a significant relationship between all constructs at the 0.01 level.
- c) The model has a high ability to predict and explain the consumer purchase behavior through Artificial Intelligence, and this was proved by the validity of the first hypothesis (H1) through the value of (R-Sq = 0.958) in the model.
- d) There is a positive relationship between Artificial Intelligence and consumer purchase behavior, and the effect of Artificial Intelligence is (95.8 %) in the variation of consumer purchase behavior in the model. These results are supported by (Davenport et al., 2020; Avinaash, 2018; Jarek & Mazurek, 2019; Qazzafi, 2019; Kietzmann, 2018).
- e) Customers' purchase behavior is affected by the demographics (gender, age, educational level, and annual income) in the model, and this was proved through testing the second hypothesis H2.

f) Structural equation model analysis for the conceptual model proved that the parameter estimate was significant and had the predicted sign (e.g., positive effect), which means the first hypothesis was supported (H1: There are relationships between Artificial intelligence and consumers' purchase behavior).

5. Recommendations

1) The effect of Artificial intelligence is (95.8%) in the variation of consumers' purchase behavior in the model. The meaning of this 95.8 % is a reflection of one of the following factors:

a) Another dimension or dimensions has not been covered in this study and searching for them is an essential element to increase this percentage.

b) The current value of dimensions needs to be increased by searching for the reasons that make the values are higher.

2) Online retailers should use the structured model in the current research as a strategy and guidance to get the real-time recommendations and suggestions, which enable them to make the right decisions and to deliver personalized customer experience based on customers' preferences, and to understand the customer journey that requires an analysis of all the data generated at each interaction during the customer journey, which in turn helps them to predict consumer behavior.

3) This study recommends online retailer to give great concern to the demographics of their customers (gender, age, Educational Level, and annual income) that should be analyzed, to get better known about how the customers' perception regarding the AI systems implemented in the online retailer they deal with will influence them in their future decisions.

6. Suggestions for Future Work

The following section contains some suggestions that may create numerous extensions and expansions to the current research.

- First of all, the current research focuses on the benefits that AI can introduce to both customers and brands, while the obstacles of AI could be a suggestion for future research.
- Second, the most significant limitation of this study is the use of an insufficient sample. The results may therefore not be representative of the perceptions of the whole population of customers. Future studies could address this problem by using larger samples worldwide.
- Finally, future research should investigate the mediating role of trust and attitude towards AI in the relationship between AI and consumer purchase behavior. As well as the moderating role of price, where price can affect future purchasing decision.

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