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HARNESSING THE POWER OF ARTIFICIAL INTELLIGENCE IN E-COMMERCE: A STRATEGIC TOOL FOR REDUCING APPAREL RETURNS

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ABSTRACT

Artificial Intelligence (AI) is today an integral part of new media ecosystem. E- commerce is reaching new heights with its implementation. With the two-fold objectives, this study aims to describe the status quo of technology and its role in modernizing e-commerce and present a shopper-centric business model that can be practically applied to reduce product returns to an optimum extent. AI is observed as a major force for innovation for e- commerce retailers. This study is concerned with describing present AI advancements, its historical evolution in e-commerce and a future perspective of its implementation through a conceptual model.

Keywords: Artificial Intelligence, E-commerce, Voice Assistants, Business Model.

1.0 INTRODUCTION – E- commerce has become one of the giant platforms for the purchase and sell of product and service. It is able to offer more differentiated services than physical store. E- Commerce is continuously developing its reach online to overcome its inability to try and touch product physically. This is also to be noted that most of the goods that have been returned back after purchasing does not even reaches back to the shelves of the retailers where as it is been dumped into the landfills. (Marc Bain, 2016) Some consumers return products that perform unsatisfactorily, while others return products that function satisfactorily for other reasons, such as not meeting expectations, size or taste. Returns are so misunderstood that retailers have accepted them as the cost of doing business," says Peter Sobotta, CEO of Return Logic (Orendorff, 2019). The National Retail Federation (NRF) reported "in 2018 average of retail return accounted for 10% of the total sales made and from which the apparel segment individually contributed up to 12.78% of the return (Retail, 2018).

Artificial Intelligence has come up as one of the factors in this weakness of online commerce, thereby reducing the losses caused to the online apparel retailers by the product returning back to the stores after being purchased. In the proposed study researcher try to explore the possible strategies for reducing the returns in ecommerce. Since Artificial Intelligence has emerged as the pivotal technology in managing online transactions while fulfilling customer value and expectations proposed research will highlight the use of AI in managing returns in ecommerce.

2.0 HISTORICAL EVOLUTION OF ARTIFICIAL INTELLIGENCE

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The term artificial intelligence was first coined by John McCarthy in 1956 when he held the first academic conference on the subject. (Chris Smith, 2006). Artificial intelligence (AI) is defined as one of the branches of computer science that can perform human oriented tasks such as problem solving, decision making and reasoning similar to human behavior (Norvig, 1995). It operates through sensors and commands and responds to the surrounding environment of operation (Norvig, 1995). McCarthy (1956) defines AI as "the science and engineering of making intelligent machines." In the early stage of evolution of AI, it was resembled as "Department of Clever Tricks" in the field of computer science. (Andrew, 2006). These clever tricks have become the inseparable part of computer science and also reflect a sense of human intelligence in itself. Now Artificial Intelligence is not limited to the field of computer but it is now used in the field of retail. By helping consumers in taking buying decisions, AI provides active sale assistance boosting their decision making (Bruce Curry, 1994).

3.0 USE OF AI IN E- COMMERCE

Artificial Intelligence came into existence for reducing the work load of humans by providing them work assistance (Felix Dominik Weberan, 2019). Retail information system architecture shell model is used as a reference model to describe a retail task (Schütte, 2017). Artificial Intelligence is playing a vital role in the field of online commerce, from managing goods till its transportation; there are n number of tasks performed by AI. It is also used to understand the extent to which machines can accurately perform the task using big data and large data algorithms (Felix Dominik Weberan, 2019). In retailing, the ability to track new customers and to link transactions over time is key (Eric T. Bradlow, 2017) and it assists retailers in reaching appropriate consumers at lower costs, due to technical efficiencies (Inman, 2017) and in this way it benefits both customers and businesses, which ultimately leads to increasing a business's profitability (Dhruv Grewal, 2017).

AI's decision support system helps e- commerce consumers in taking better shopping decisions (Bruce Curry, 1994) . Chatbots, voice assistants, face recognition devices and augmented reality are the prominent usage of AI by consumers (Levy, 2009). In order to increase consumer's shopping experience, retailers have realized the need to grab and utilize AI (Chopra, 2019). The global retailers like IKEA and Amazon have also implemented AI in their working and this has also provided inspiration to many other retailers in the segment to adopt and implement AI. In the field of retailing, future growth will be headed by AI (Dhruv Grewal, 2017). Logistics and Supply Chain Management are also benefitted by the use of AI, the positive impacts of AI in this area can be categorized as: - it has improved the predictive capabilities of the company, made the human driven vehicles as autonomous. (Pandey, 2019).

4.0 AI TOOLS

4.1 Chatbots- As the name suggests it is a chatbot that appears in front of the customers acting as an aid for solving their purchase related issues through chatting (Carayannopoulos, 2018). The interaction between the parties using chatbots is not as real as a human interaction i.e. it cannot replace human interaction but act as a cost-effective way of answering routine questions of the customers. (Vincze, 2017) Chatbot is a platform through which there is an immediate contact between the customer and the application, and it also addresses and rectifies the problems that are faced by the users of Instant Messaging (IM) as it is more easy way of getting

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more information as compared with the IM. (Carayannopoulos, 2018), and by this social conversation the need of belongingness of consumers are also satisfied (Heung-Yeung Shum, 2018). Even though after having so many different kind of benefits, various studies shows that chatbots are not capable of performing specialized tasks like providing customized information they can provide only limited number of information or routine information (Chopra, 2019).

4.2 Voice Assistants: Voice assistant is one of the AI tools where voice commands are used as the mode of interaction with the consumers through voice command (Hoy, 2018). Voice assistants can be linked with smartphones, following the voice commands to perform a variety of day-to-day tasks such as send and read text messages, search information, answer queries, make calls on phone, play music as well as control electronic devices in consumer homes such as television, lighting, air conditioners, alarms and locks. (Chopra, 2019). But there is always a concern about the invasion of privacy to its users (EFTHIMIOS ALEPIS, 2017) as the authentication mechanism is the owner's voice which, for instance can be easily mimicked/ copied by some random person and full access of the device can be granted to him. (Courtney, 2017).

4.3 Virtual Reality- This is the generalized term for any type of experience that essentially places the user "in" another world or dimension. It may be used in reference to entirely digital worlds, or worlds that incorporate a mix of real and virtual. VR brings immersion that allows an emotional intensity far greater than traditional media (walker, 2018). Virtual Reality (VR) accompanies another concept known as Virtual Dressing Rooms (VDR), this tool of AI tends to provide the best fit and also allow the consumers to see how they look in the considered clothes (Gallayanee Starwind Yaoyuneyong, 2018) and in this way it creates a more realistic product experience (Mark Yi-Cheon, 2017). VDRs, can provide many benefits to online retailers as well by increasing consumer perceptions of known elements such as enjoyment, immersion and usefulness, which, in turn, improves both buying intention and attitudes towards the media, relative to non-AR web-based product presentations (Mark Yi-Cheon, 2017), along with the concept of VDR there adds a new concept of Virtual Hairdressing Room (VHR) that uses various techniques developed for the process of hair simulation, having an ultimate aim to provide fast hairstyles to the consumers (Nadia Magnenat-Thalmann, 2006).

4.4 Augmented Reality – It is a simple combination of real and virtual (computer-generated) worlds. Given a real subject, captured on video or camera, the technology 'augments' (= adds to) that real-world image with extra layers of digital information. (Maxwell, 2010). In other words, these tools combine the virtual/ fundamental elements with reality in order to augment the reality. (Anna Watson, 2018). Kotler (1973) has highlighted the importance of creating sensory touch points within the retail environment which can lead to better consumer experiences, shifting their attention from the product-oriented approach to the holistic retail experience, which will ultimately lead to an emotional response from consumer while making any purchase (Anna Watson, 2018). AR can enhance sensory perceptions for consumers by superimposing virtual elements directly into the real-time environment (Gallayanee Yaoyuneyong, 2016).

4.5 Mixed Reality- This is mixed form of real content, and digital content (walker, 2018) which is the combination of Augmented Reality (AR) and Virtual Reality (VR). One of the best examples of MR is Microsoft HoloLens which is a pair of mixed reality smart glasses

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developed and manufactured by Microsoft (Ms. S. Karthika, 2017). It can be used for doing many activities such as 3D Computer-Aided Design, remote instructions, gaming, decorating (Ms. S. Karthika, 2017).

5.0 AN OVERVIEW OF AI'S IN- STORE TECHNOLOGIES: The buying and selling activities are greatly affected by the technological innovations taking place in the concerned field. This section of the paper deals with the recent innovations and technologies used by the retailers and online sellers.

5.1 Barcode Scanning: One of the remarkable developments in the field of retail was the use of UPC barcode scanning technology. The first product sold by bar code scanning was in the year 1974 at a Marsh supermarket in Troy, Ohio- it was a packet of chewing gum. Scanning the items with the help of barcodes provided the shoppers with the real - time transaction data, and they were able to easily track and identify the fast-moving items (Inman, 2017). Using bar code scanning technology enabled sense of more accuracy on the part of the shopper; moreover, they were able to easily combine the data on casual factors such as price, feature, advertisement, money etc. (Inman, 2017). The use of scanning data increased the level of research in the field of quantitative models of consumer behavior (Peter M. Guadagni, 2008).

5.2 Video cart: This concept made a good contribution in the field of location-based marketing. Malec, John and Joseph P. Moser filed a patent in 1988 for an "Intelligent Shopping Cart System Having Cart Position Determining and Service Queue Position Securing Capability" (Malec, 1994). This abstract explains the system as a shopping cart having a cart mounted display which gets activated once got in contact with the transmitters associated at some fixed location (Inman, 2017). There were many reasons for the failure of the system like the location of the display screen was on the handle which made the cart uncomfortable to handle on the side of the shoppers as it blocked the view of the cart. Another reason was the retailers were not able to keep the batteries on the cart fully charged all the time, so often times the shoppers were pushing a non-functioning cart.

5.3 In- Store Coupon Dispensers: Under this program coupons were distributed to frequent purchasers of the store and this program was named as Frequent Shopping Program (FSP). Here the customer's purchase history is compared with the available coupons. The shopper just needs to enter the FSP number of the customer into the dispenser which in turn after careful evaluation of the shopping history provide the most fitted coupon to the customer, and these coupons are then redeemed at checkout.

5.4 Kiosks: These are small cubicle consists of a touchscreen, a computer and some other gadgets as well. They can be used for collecting information about a product or service and for purchasing it. Most of them are located in public places such as airport, malls hotel etc.

5.5 Mobile application: Every e-commerce website and retailers now days have its own mobile application. This can also be called as M-Commerce or Mobile Commerce. However, the working of these apps is a bit different from one another. Every retailer gives their best in making these apps more customer friendly and easy to use. People are able to do many activities using these apps other than just buying, they are able to avail various coupons, offers which are time to time available on it. Moreover, there are various other festive offers and sale that

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the customers would not have otherwise got if they did not have the respective application installed in their mobile phones.

5.6 Self Scanning: Another name of self-scanning check out is self-checkout. It is an automated process which enables a shopper to scan, bag, and pay for the purchase they made without the help of the cashier. A technology ahead of self - checkout is checkout free shopping, which is launched by Amazon and it is named as Amazon Go. Here the waiting time of the customer is tried to minimized to zero i.e., the customer need not to wait in the line for making the payment of the purchased made by him from the store. All he needs to do is to shop from the store and leave without making any payment. For experiencing this facility by amazon, the shopper need to have an amazon account and free amazon go app. The walk out technology automatically detects when the products are taken from and returned back to the shelves and keeps track of them in a virtual cart.after shopping when the shopper leaves the store, the receipt is set to him and his amazon account is charged (amazon.com) .

5.7 QueVision: Another initiative that is taken to reduce the waiting time of shoppers at checkout is QueVision. This system worked on the basis of "Little's Law" (Little, 1961) according to it, the more checkout lanes automatically get opened when the shoppers waiting time increases the preset threshold.

5.8 Smart Shelves: Smart Shelves technology is experimented to avoid the irritation caused to the shopper from the situation of out of stock. Here weight- sensitive mat is placed on the shelf and a notification is sent to the store personnel when the last item from the shelf is removed, so that after getting notified the responsible person re-fills the shelf with the previous stock and the shopper is not faced with the situation of out of stock.

5.9 Gravity Feed Shelving System: This system consists of sloped shelves, which works through the gravitational push. Whenever the item kept in the front is removed the next item automatically shifts to the front position. This system automatically maintains the appearance of the shelves and requires less manual attention from the store personnel and lowers labor cost.

5.10 Scan and Go: Under this technology the shoppers while visiting a store can the items as they put them in their basket, after that this scanned data is being used for making the payment without again scanning the item at the check point. This technological up gradation saves the time of the shoppers at the check point providing them more satisfaction through convenience and reducing wait time for making payment along with labor savings to retailer.

6.0 RETURNS IN ECOMMERCE

One of the major affairs in case of online retailing is that it cannot provide customer with the exact fit or measurement every time. Although sizes are mentioned on the display section of the website but there is always a possibility that the size mentioned may not fit the buyer because many times it happens that a customer who gets a fitting of "M" (Medium) size t- shirt after the manufacturing of the apparels according to the different physique. For instance, it is seen that most Americans or Caucasians are physically larger than Indians, so the size "M" manufactured according to an American physique will automatically be ill fitted to an Indian with a common perception of medium size measurement.

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Physical examination of certain factors like fabric, color, design also plays a very crucial role in the purchase decision of the buyer. Due the absence of this physical touch, the ordering decisions tends to carry more risk. For reducing this risk on customer's side, online retailers mostly offer lenient return policies.

7.0 AI- DRIVEN SMART SIZING MODEL FOR REDUCING E- COMMERCE RETURNS

7.1 Problem Statement: Different retail technologies have been successfully integrated to help retailers online. The proposed business model has been so created for resolving online apparel returns.

7.2 Proposed Business Model:

A. Key Components of the Model:

1. AI-Enabled Smart Camera System

1.1 Uses advanced algorithms to analyze the shopper's physique in real-time.
1.2 Detects body changes (e.g., weight gain/loss, posture, muscle tone).
1.3 Ensures accurate size recommendations.

2. Voice Assistant Integration

2.1 Provides real-time feedback on size suitability.
2.2 Notifies the user about body measurement changes.
2.3 Guides the shopper in selecting the most accurate size.

3. Machine Learning-Based Size Prediction Engine

3.1 Uses past purchase data, return history, and user preferences.
3.2 Learns from user feedback to improve recommendations.
3.3 Adapts to changes in body measurements over time.

B. Working of the Model: This model will work in two phases i.e.

Phase 1: AI-Based Size Detection

- The customer engages with the online store's **AI-powered sizing tool**.
- The smart camera captures the user's physique and updates real-time body measurements.
- AI algorithms analyze the latest body changes and compare them with previously recorded data.

Phase 2: AI-Guided Purchase Decision

- If a user selects an apparel size, the AI system verifies if it matches their updated body measurements.
- If a discrepancy is detected, the **voice assistant** alerts the user:

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- Example: "Your body size has changed from 34 to 36. We recommend size 36 for a better fit."
- The user can modify their order accordingly, reducing the chances of return.

C. Expected Benefits of the Model

- Enhanced Accuracy in Apparel Sizing → Reduces return rates due to size mismatches.
- Improved Customer Experience → Offers a personalized shopping journey with AI assistance.
- Retailer Profitability Boost → Lower return costs and improved inventory management.
- AI-Powered Future Scalability → The model can evolve to include other fashion categories like footwear and accessories.

8.0 CONCLUSION

The study highlights the transformative role of AI in e-commerce, particularly in addressing the persistent issue of apparel returns. The proposed AI-driven Smart Sizing Model presents a strategic solution for retailers to enhance size accuracy, improve customer experience, and optimize inventory management. While challenges such as data privacy and technology adoption persist, ongoing advancements in AI and machine learning hold promise for the continued evolution of AI-driven solutions in e-commerce. Future research should explore the integration of additional AI capabilities, such as deep learning and biometric authentication, to further refine and expand the impact of AI in online retail.

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