

ARTIFICIAL INTELLIGENCE AND CONVERSATION COMMERCE: A REVIEW ON CHATBOT TECHNOLOGY AND ITS IMPACT DURING COVID 19 ON ONLINE RETAILING

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INTRODUCTION

Artificial Intelligence is increasingly becoming a part of our daily lives and is made up of many technologies and branches and each has its own benefits. Conversational commerce or chatbots are one such AI application which is also known as Intelligent Agents. Intelligent Agents, when assimilated into our daily life, as it is increasingly happening, can perform several tasks such as searching for information, setting alarms, reporting weather etc. A chatbot is an AI based technology using robotics and Human-Computer Interaction (HCI) (Bansal and Khan 2018). It can respond to any stimulus such as text or voice and provide solution to the question asked or the task assigned. Hence they are also called Intelligent Agents. A chatbot is programmed in such a way so as to understand one or more human languages (e.g. English, Hindi etc.) by using Natural Language Processing (NLP) (Khanna et al, 2015). As the pandemic has gripped the world since early 2020, it has been more than a year now. Over this period online shopping has increased and so has the use of these intelligent conversational bots or chatbots. So whether it is “EVA” from HDFC or “Clara” these chatbots are in the forefront of customer service in the online world today.

The users always have the desire to be understood and want one-on-one customised personal service. Chatbots can provide that. Thus, Chatbots are making a huge foray into marketing and technology-enabled retailing, offering several advantages such as instant refunds/exchanges on products, convenient service, easy accessibility, and 24/7 availability. They have become the “go-to” platform for users to receive answers to their queries. They offer a unique and valued personalized service which adds a great deal to the user experience (UX) which results in enhanced OCE (online customer experience). This eventually means increased trust towards the e-retailer and increase in sales in the ecommerce environment.

When one actually experiences a chatbot or an instance of conversational commerce, one realizes that it is easier to garner information about products and connect with brands. Since the chatbots continuously learn and memorise your previous searches, they can track products that you may not immediately remember in your next visit to the website.



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Methodology

This study is based on review of literature and research of articles from the newspaper and other sources on the internet. The objective of the paper is to understand the impact chatbots have today in different areas such as healthcare, online retail and customer service. It also explains the technology behind chatbots and their impact in personalization of the customer service.

Chatbots and Conversational Commerce

The definition of chat bot is “a computer program to simulate the conversations between human and machine”(Leong, Goh & Kumar, 2017).Lommatzsch (2018) has done seminal work on chatbots. His research was related to self-service kiosks in hospitals but it is equally applicable to ecommerce in the form of online chat bots. Lommatzsch (2018) in his research discusses the workings of a chat bot. A bot provides answers to specific questions taking into consideration previous behaviour of the customer. The term “Conversational Commerce” was coined by Messina, in 2015 to describe the intermingling of messaging apps and internet shopping. One of the objectives of personalization is to help the customer to find the solution in the least amount of time. The customers want fast answers and chatbots are able to provide these answers to the customer questions in the least amount of time; (Lommatzsch, 2018). In ecommerce today conversational commerce is used for brands and consumers to communicate (Marwade et al.,2017). Hence chatbots are AI assistants which help customers explore various product offerings, receive services and perform different purchases round the clock.

Chatbot Technology

In the dictionary, a chatbot is defined as “A computer program designed to simulate conversation with human users, especially over the Internet”.

Here are some fundamental concepts of chatbot technology:

Pattern Matching: The chatbots gives an answer (Response R) based on the word or question spoken (Stimulus S) which means that the answer or output (response) is produced based on the user’s input Marietto (2013). ELIZA and ALICE were the first chatbots developed using pattern recognition algorithms. The problem with this is that there is no storage of past responses, which can lead to looping conversations (Ramesh et al. 2017).

Artificial Intelligence Markup Language (AIML): This language was created in the mid 90’s and is based on Pattern Recognition or Pattern Matching concepts. It is applied to natural language modeling for the dialogue between humans and chatbots that follow the stimulus-response approach. It is an XML-based markup language and is tag-based (Adamopoulou and Moussiades 2020).

Latent Semantic Analysis (LSA): This also can be used along with AIML for the design of chatbots. It is used to discover similarity between words and phrases (Akma et al, 2018). Template-based questions like greetings and general questions can be answered using AIML while other unanswered questions use LSA to give replies (Shawar& Atwell, 2007). There are several scripts which are used in chatbots such as “chatscript” and “Riverscript”. “Chatscript” which is a successor of AIML is an expert system. The heart of the chatbots, consists of its ability to process natural languages. So what is NLP?

Natural Language Processing (NLP): is an area of artificial intelligence, explores the manipulation of natural language text or speech by computers. Knowledge of the understanding and use of human language is gathered to develop techniques that will make computers understand and manipulate natural expressions

to perform desired tasks (Jung,2018). Most NLP techniques are based on machine learning. Natural Language Understanding (NLU) is at the core of any NLP task. It is a technique to implement natural user interfaces such as a chatbot. NLU aims to extract context and meanings from natural language user inputs, which may be unstructured and respond appropriately according to user intention.

Entities and Context: An entity is a tool for getting the parameter values from natural language inputs. For example if the user wants to know “What is the time in Mumbai, India”, the entity “Mumbai, India” has to be stored in the context of time. The user’s desire is to get the time in a specific place. Contexts are string datatype that store the context of the object the user is referring to in the question.

There are different types of chat bots which can be created and programmed i.e. whether they are knowledge based or transaction based. It is Machine Learning algorithms which give chatbots the ability to provide service and detect the sentiment of the customer. It also has the ability to relate to customers emotionally as humans do. This is a new area of research (Folstad, Nordheim & Bjørkli, 2018).

Amazon Alexa is one such intelligent agent which has garnered immense popularity and has become a household name in several countries. Virtual assistants from Apple, Microsoft and Google have now entered the market and are equally popular. They are Siri, Cortana and Google Assistant respectively. These are all knowledge bots which help you to make a decisions based on the question one asks.

Amazon Alexa and other Virtual Assistants

Amazon.com was founded in 1995 in Seattle by Jeff Bezos. From an online book store it quickly became the biggest ecommerce

company and over the years has evolved into selling other products and software services such AWS (Amazon Web Services), Amazon Prime, and Amazon Alexa. (CNN, 2019) Amazon is today one of the most innovative companies with respect to using AI technologies on their website and in other areas of business (Levy, 2018; Chatterjee, 2018). This was done either by its own R&D or by acquiring technology in that area. In 2006, Amazon started their cloud computing service (AWS) which has grown into a huge revenue generator. They offer artificial intelligence solutions to other companies (Levy, 2018; Amazon Web Services, 2019).

Amazon Alexa

Amazon Alexa, or just Alexa, is a virtual assistant AI technology developed by Amazon. It was first used in the Amazon Echo smart speakers developed by Amazon. Alexa is a home automation system, in that it can control different smart devices in the house. In the last year 2020, Alexa saw a 67% jump in user interactions across India. Alexa is voice activated assistant allows customers to use their voice to ask Alexa to perform certain tasks including: Asking what is the time, or headlines of the day; putting on a certain movie; and even placing an order (Wired, 2017; Reinartz, 2019). Amazon is constantly innovating and enhancing their artificial intelligence technologies. It is capable of voice interaction, music playback, making shopping lists, streaming online content, and can also control several smart devices as a home automation system.

Google Assistant

Google Assistant is an artificial intelligence-powered virtual assistant developed by Google that is primarily available on mobile and smart home devices. Google Assistant has a much more comprehensive

search than Amazon Alexa since search is Google's core competency. Google Assistant can do almost the same things as Alexa.

Apple's Siri

Though today Alexa and Google's Google Assistant are more talked about, but it was Apple which first introduced Siri their voice assistant with their iPhone. All the Virtual Assistants available in the market today have almost comparable functionality.

The other popular e-retailer which is making headway with artificial intelligence is Flipkart. Flipkart is the biggest Indian ecommerce company headquartered in Bengaluru, Karnataka with about 47% of the market share. Flipkart, recently sold 77% of its stake to Walmart for US\$16 billion, today leverages artificial intelligence technology to assess the emotional and functional motivators that affect consumer buying behaviour. AI Technologies are used by Flipkart to enhance user experience of both buyers and sellers. They are now using Chatbots in local languages to make in-roads into the rural markets as a differentiator. The lockdown has caused a boom in e-commerce forcing people who normally don't shop online to enter the fray. Also, it is interesting to note that it is not the major metros which are generating the online sales but the tier 2 and tier 3 cities in India. Tier III markets have seen a 53% year-on-year growth in e-commerce adoption, with fashion and apparel being the drivers of change of change in this region.(Walmart and Flipkart both hit the mark with e-commerce – a 97% jump in US while India sales exceed pre-COVID level (Business Insider, Aug 2020).

During the midst of the pandemic in August/September 2020, maximum online sales were registered in the smaller towns of India. In order to capture and retain this market they have introduced the vernacular language voice assistance to provide immediate customer

support in the native language. Today not only in ecommerce where they have a mainstay but chatbots are found in other fields, primarily healthcare.

Chatbots in Health Care

There is research to testify that Chatbots are increasingly being used in Healthcare particularly in the case of mental health issues. The chatbots used in these cases are mostly rule-based and they were used for training and therapy. Chatbots mainly focused on depression and autism patients and are making steady headway in this area though it is still in nascent stages of research (Alaa et al., 2019). The findings from their study show that there is still a need to improve the linguistic capabilities of mental health chatbots (Laranjo et al.,2018). Their ability to understand the patient's problem and react appropriately to user input has to be increased. The chatbots responses should be dynamic and should have enhanced linguistic capabilities. Most of these are rule-based chatbots but enhancements have to be added to the knowledge base since the capabilities of the chatbot will always depend on the completeness of the knowledge base (Laranjo et al., 2018). Today Chatbots are also being used in situation where it imitates an actual physician or doctor in a clinical environment. It can come up with alternative treatment patterns using data analytics. Clinics are now beginning to offer preventive services by using medical bot without human intervention in what is called e-health checkup.

Chatbots for Customer Service

With AI (Artificial intelligence) today even if humans are not available there are chatbots now which can offer customer support in all areas. Research shows that 1 out of 5 users completes a purchase with the help of chatbots, 40% users want offers and deals from chatbots and consumers are willing to spend more than

\$500 while using a chatbot. Since the chatbots use natural human language, they are able to provide a more enjoyable and trustworthy experience for the customer. The other reason that chatbots are able to build close brand relationships is because of personalization. These human-like chatbots learn from previous experience and can adapt to specific consumer characteristics. Hence introducing chatbots into the shopping process can promote stronger brand experiences, better customer relationship management and increased sales.

However, there are instances where customer satisfaction with chatbots is not all positive. Sometimes, the customers feel frustrated because the bots misunderstand the question and the conversation goes into a loop with no resolution. The transfer to the human service counterpart for more technical issues is not seamless and smooth and it gets frustrating for the customer. More research is ongoing in this dimension.

Conclusion and scope for future research

There is scope for further research to observe whether human-computer interactions can be more personalized by matching consumer personality with congruent machine personality using language. Research in branding has shown that people are more likely to be responsive to others with the same personality as theirs. This is similar to how in an ad; the product's personality is matched with the endorser's personality, usually a celebrity admired by the consumer. This emphasizes the likeness between the characteristics of the product and the characteristics of the consumer. There is still not much research to extend this theory for human-computer interactions such as chat bots. Whether using the context of the question, can the chatbots assume a congruent personality and provide the right response. This is an area that can be further explored.

To conclude, Chatbots will continue to evolve and provide services to wider audiences. They are now making inroads into other sectors such as education, scientific data collection etc. and can continue to reach out to a lot of people through messaging apps. Chatbots are becoming highly efficient and effective in providing the superior customer service. In addition, they can achieve higher savings by reducing returns, increasing the operations of customer service departments. In the future if e-retailers continue to expand on their usage of AI with ecommerce, multiple opportunities will be created, not only for domestic AI startups but also for the overall employment and growth of the Indian economy.

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