Retail chatbots: The challenges and opportunities of conversational commerce

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Abstract Artificial intelligence (AI) refers to the ability of machines and/or robots to perform intellectual tasks like humans. AI technologies are widely used to support different activities in retail operations. In particular, retail firms have adopted chatbots to interact with consumers through various communication channels, including social media, live chat, SMS etc. In addition, chatbots have been used to support conversational commerce in which companies automate conversations with consumers about product selection and assist consumers to make informed choices throughout the shopping and decision-making processes. To investigate the state of the art of chatbots in the retail industry, this article qualitatively studies commercial chatbots from 40 retail firms. The study finds that chatbots assist consumers in completing general tasks, such as searching information, purchasing products, making reservations and collecting feedback. Chatbots are good enough to perform such general tasks, although they have limited capability with respect to processing and interpreting natural language. Chatbots also provide menus to address the most predominant issues encountered by consumers while running at a lower operational cost. It is anticipated that chatbots will gain popularity in the retail industry, and consumers would benefit from chatbots with improved features like more accurate predictions and better product recommendations.

KEYWORDS: artificial intelligence (AI), chatbot, conversational commerce, retailing

INTRODUCTION

The retail industry is becoming increasingly competitive, especially as online channels and e-commerce are growing rapidly. Amazon, in particular, is continuing to expand its market share at the expense of traditional physical retail chains. Not content with its position as the market leader in e-commerce — taking almost 50 per cent of all US e-commerce dollars spent in 2018 — Amazon is now opening physical stores across the USA.[1] While consumers are increasingly demanding a rewarding shopping experience with personalised offerings and messages, retailers like Amazon are increasingly adopting data-focused innovations, such as artificial intelligence (AI) together with computer vision and sensor fusion to meet these expectations.[2] AI, in particular, is enjoying great attention from retailers. AI simulates human intelligence processes like reasoning, learning and self-correction using machine and/or computer systems. The three distinct capabilities of AI, namely natural language processing, machine learning and optimisation, allow firms to sell much more intelligently.[3] AI is emerging as the tech world's most powerful tool for helping both online and traditional physical retailers to retain customers and compete with their rivals.

Retailers are adopting AI at a breathtaking pace.[4] Over 80 per cent of retailers expect that their companies will use intelligent automation by 2021, while 40 per cent have already adopted some form of AI.[5] Although still in its early days, the usage of AI already boasts remarkable efficacy.[6,7] AI applications like natural language processing, digital assistants and visual search are widely used by retailers. As AI rapidly becomes more sophisticated, the capability for retailers to manage and integrate it into operations becomes crucial for maintaining competitiveness in the highly competitive business environment.

Within the retail industry, AI has been a game changer for marketing. AI supports retailers to perform different marketing functions, such as targeted trade promotions, one-to-one marketing campaigns, etc. Understanding customer needs is crucial for retailers to attract and retain customers. Customer needs can vary by demographics, household type, lifestyle and so forth. To attract and satisfy consumers, retailers require in-depth and real-time information about their customers' needs. However, timely manipulation of the large amount of data collected from sensors and machines, eg point-of-sale systems, presents challenges for practitioners who must implement complex technologies to analyse data and make appropriate recommendations. With the application of AI technologies, retailers can analyse consumer behaviour and shopping baskets to identify and comprehend buying motives and patterns, and thus create personalised messages and unique advertisements for individual consumers in real time.[8] This is one of the reasons why more and more retailers are turning to AI to optimise business functions and boost productivity.[9]

Both retailers and their supply chains are employing AI technologies to collect consumer insights in an automated manner. This can help to forecast inventory level and sales automatically, thus optimising supply chain management to avoid a bullwhip effect. AI gains ground in product development, supply chain management and assortment planning where inventory levels are continuously adjusted thorough forecasting to alleviate margin erosion, understocking and overstocking. This helps retailers to manage customer expectations and satisfaction by making product available when customers need it, thus preventing customers from having to switch to other brands. AI can help retailers to automate the progressively mechanised supply chain backend that supports physical retail supply as well as web-based sales. AI algorithms are also useful for informing business decisions.[10]

Recent research suggests that by the end of 2020, 85 per cent of consumer interaction will be managed by AI,[11] 30 per cent of e-commerce revenue growth will be attributable to AI technologies, and AI will be adopted by at least 60 per cent of companies for e-commerce.[12] AI is a growing technology that helps retailers to improve their sales tactics, while providing value to consumers. For instance, through AI, social media marketing and programmatic advertising provide a holistic view of consumer behaviour, deeper insights and predictive analytics. New retailing devices such as vocalised user interfaces offer innovative means of adding value to brands. Based on a global independent survey, 61 per cent of people agree that AI is making society much better.[13] Another study on consumer perception of AI found that 63 per cent of customers believe AI can solve difficult problems, while 59 per cent of consumers agree that AI can make people's lives more fulfilling.[14] Furthermore, 63 per cent of people do not realise they are utilising AI tools already.[15] This lack of awareness provides retailers with an opportunity to foster positive feelings of excitement and trust.

This article will start with a general discussion of the application of AI in the retail industry. It will then focus on chatbots, ie the software that simulates interactions with consumers automatically through various media, including social media, live chat and SMS. Specifically, it describes a qualitative study of 40 chatbots that was performed to identify the current state of the art of AI technology. Managerial implications regarding the application of such chatbots will be provided in the final section.

ARTIFICIAL INTELLIGENCE IN THE RETAIL INDUSTRY

AI machines can mimic intelligent human behaviours, such as learning, analysing and problem-solving. Machines equipped with AI can sense, understand and act like a human being in the real world, and they are able to learn from experience and make decisions accordingly. AI applications relevant to the retail industry include robotics, machine learning and natural language processing. Robotics involves the automation of tasks that are traditionally carried out by humans, such as warehouse picking and packing. Natural language processing refers to the capability of a machine to comprehend a human's spoken or written language and respond accordingly. For example, in the retail context, it is possible to leverage natural language processing to collect information about a particular product without any additional keystrokes. Machine learning, meanwhile, enables retailers to analyse a lot of data and recognise trends and patterns in consumer habits and shopping styles. According to one survey, 16 per cent of retailers are using some form of AI, while 20 per cent are planning to adopt it within the coming year.[16] The same survey suggests that another 18 per cent of retailers plan to implement AI in the longer term.

Individualised marketing

Retailers collect data from different sources and use this information to segment consumers into multiple markets based on criteria such as consumer preferences, shopping behaviours and demographics. Such information, however, is prone to change. In such cases, traditional marketers may make incorrect assumptions and use a flawed basis for segmenting customers. This limitation can be addressed through the adoption of AI with the capacity for deep learning. Machine learning can examine a large amount of data, recognise patterns, and group similar data as appropriate. Machines can analyse multiple pieces of information simultaneously to determine trends and associations among data. Such information is used to make highly personalised offers to consumers.[17] Analysis of point-of-sale and e-commerce transaction data is used to

classify and segment consumer groups. Big Data analysis and AI have given rise to highly personalised marketing tactics that obviate the need for human intervention. These tools examine the purchase history of consumers and online behaviours, including browsing and social media activities. With AI, retailers can accurately target consumers on an individual, personalised level.

Trade promotion

To promote their products, companies make considerable investments with retailers to increase market share and revenue. To understand whether a trade promotion has been effective currently takes some weeks, and 72 per cent of promotions fail to survive. To respond to the endless developments in the market, promotion decision makers must adjust plans regularly; if they do not make such changes, their promotions cannot break even.[18] Approximately 60 per cent of companies are still using manual processes and generic software like spreadsheet applications, and lack meaningful, accurate and real-time information to support the planning, optimising and management of their trade promotions.[19] AI can provide channel managers and brand managers with guidance and insights so they can allocate monetary resources more sensibly and ease margin erosion.

Supply chain management

Conventional merchandise management planning methods that employ historical sales data to forecast demand may cause errors and inaccuracy, resulting in overstocks, out-of-stocks and goods being returned to vendors. This can leave consumers dissatisfied and retailers unable to attain their objectives, financial or otherwise. Machine learning draws on historic data from social media, online reviews, performance of similar items, demographics and other real-time data to forecast inventory, supply and demand throughout the entire supply chain. These predictions may be made by colour, size, stock-keeping unit, store or other criteria.[20] Machine learning elevates data from the internet, and recognises and corrects data errors and risks in the supply chain. This helps to optimise product delivery, while balancing supply and demand without human analysis. Retailers may face a multitude of challenges regarding warehouse management. Companies must understand the supply chain and synchronise logistics and planning to drive value. Machine learning can map various scenarios and demand patterns for more efficient channel allocation and inventory optimisation. This becomes an essential step in timely logistics and replenishment.

Assortment planning

In traditional planning, product assortment requires the examination of sales data collected during the previous year as well as new trends and developments in the industry. However, consumer preferences and habits are constantly changing. AI algorithms can predict the most relevant products to be added to the inventory after analysing the product assortments of competitors, and the shopping behaviours of consumers in a real-time manner.[21] Machine learning can be used to read consumer reviews on e-commerce websites and social media, and can be taught to classify posts and identify textual patterns. AI can even identify foul language and fake reviews. Online reviews are voluntarily provided by individual consumers after their purchasing the product. This is important for retailers because they can determine how a product item is performing in other markets and decide whether or not to order it.[22]

CHATBOTS IN RETAIL

A chatbot is a commonly used AI application that simulates conversation with human users in natural languages (such as English) through mobile apps, websites or messaging applications.[23] Chatbots are often portrayed

as a promising and advanced interface that simplifies the interaction and the communication between computers and human users.[24,25] From a technological perspective, chatbots represent the development of a question-answering application of natural language processing.[26–28] Figure 1 shows how a typical chatbot works.

Chatbots perform two core tasks.[29] First, the user initiates a request like 'Please show Brand X products'. The chatbot receives and analyses the request in order to understand the user's intent and identify relevant entities. This is the most important step because a chatbot cannot provide correct answers if it cannot understand the user's request. Secondly, after processing the request, the chatbot returns its response. This may be:

- a predefined and generic answer;
- an answer retrieved from the database;
- contextualised information based on the user's request;
- the result of actions performed by backend applications; or
- a disambiguating query to further clarify the user's request.

Using the newest AI technology, chatbots create an interesting and natural purchase experience for consumers.[30–32] Chatbots provide customised shopping experiences and enable retailers to manage relationships with different consumers via the provision of one-to-one offerings. In addition, chatbots can engage with consumers who are unfamiliar with the brand and its products and through conversations convert them into new customers.

Chatbots also help companies to reduce the running cost of customer service while improving the consumer engagement process. To be successful, human intervention is important when optimising and training the chatbot system. The chatbot system entails various tools and approaches, such as semantic understanding, natural language processing and machine learning.[33] Depending on the problems to be addressed, some technologies are more suitable than others.[34]

Chatbots are usually important on social media platforms because conversational commerce enables two-way interactive communication with consumers. This not only provides information to users, but also builds up a relationship from which the chatbot can learn about the consumer.

Today, the reach of messaging apps surpasses that of social media networks. The adoption of such messaging apps is growing rapidly, and it is estimated that 37 per cent of the global adult population now uses at least one.[35] Over the past decade, there has been a huge shift from mass marketing to individualised marketing on social media platforms such as Twitter and Facebook. Conversational platforms are expanding and a chatbot interface provides the most natural way for human users to communicate with technologies.

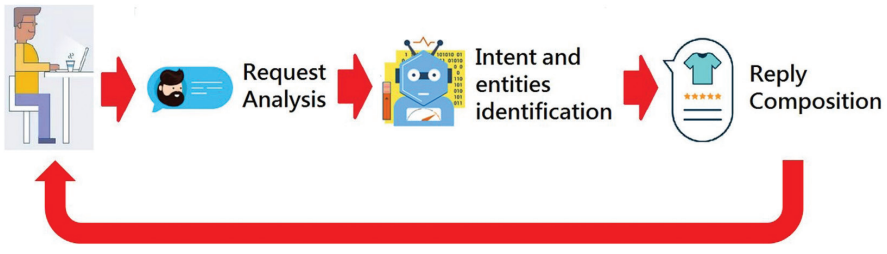

Figure 1: Core tasks of a typical chatbot

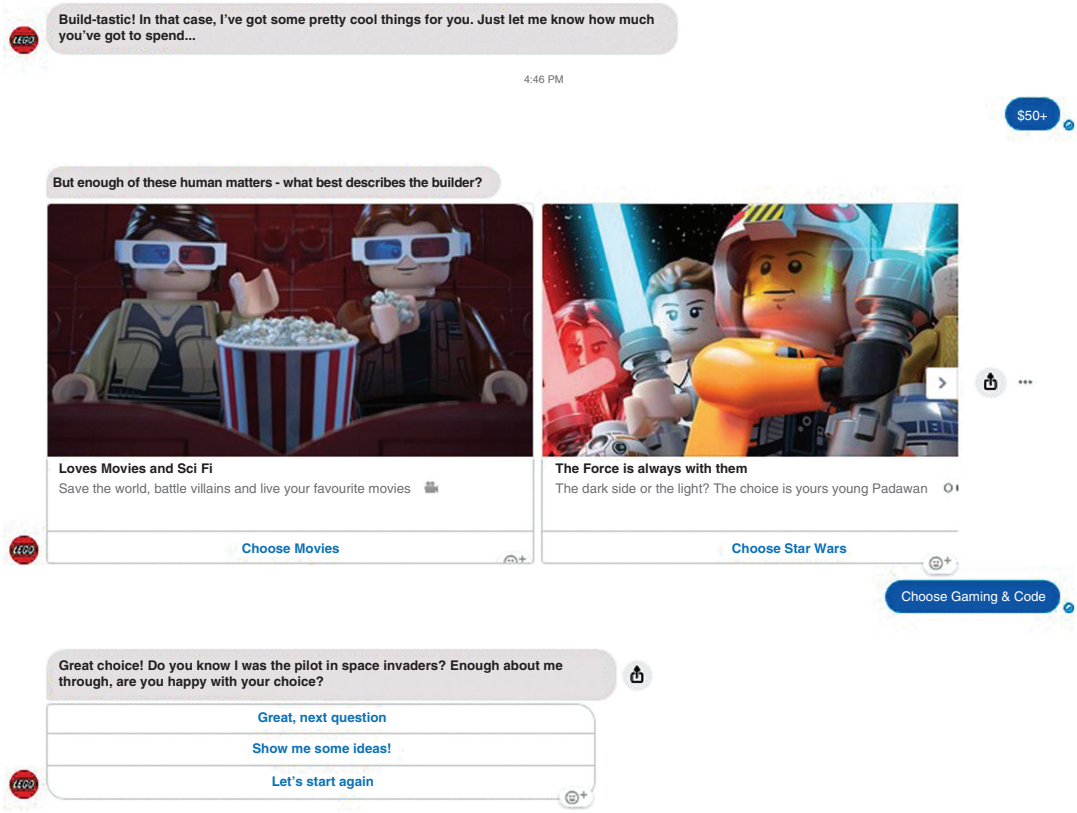

Figure 2: Example of conversation with a chatbot (LEGO chatbot)

Source: https://insights.jumper.ai/e-commerce-chatbots-examples/

There are several types of consumer experience in conversational commerce.[36,37] First, consumers make their initial purchase and the companies send them relevant messages to thank them and solicit future patronage. Secondly, after a consumer has purchased, for example, an electronic product but it does not work properly, the consumer may send a message to the company for assistance. Then, the company automatically recognises the problems and sends the appropriate guidance. Thirdly, the company sends a customised notification to targeted segment of consumers for information relevant to them. Fourthly, the company sends a message to a consumer who has shared constructive reviews on social media.

In conversational commerce, a chatbot can respond reactively and proactively, and its communication is consistent every time (see Figure 2). A chatbot can collect data from its conversations with users and also learn from such data. Chatbots are increasing in popularity because traditional online experiences are no longer sufficient for today's consumers. Consumers expect to find information with the click of a button, yet they experience various problems,[38] including:

- websites that are difficult to navigate;
- an inability to acquire answers to simple questions;
- difficulty researching details about a business;

- services that take too long to find;
- poorly designed smartphone apps;
- unusual on-site search functions;
- poor-quality online forms; and
- impersonal services.

By the end of 2020, 85 per cent of the consumer engagement process will be performed with chatbots without human interaction.[39] This is reflected by the finding that 80 per cent of businesses claim to be utilising or preparing to utilise chatbots.[40] The following are the use cases for chatbots.[41]

- acquiring a fast answer in an emergency;
- solving problems and resolving complaints;
- making a reservation;
- paying bills;
- purchasing products online; and
- collecting feedback after purchase.

Website chatbots fall into three categories: contextual, keyword recognition-based and menu-based. Many companies use website chatbots to leverage the speed and convenience of live chat to enhance and personalise the shopping convenience for consumers.[42] Website chatbots usually perform functions like greeting consumers, making appointments and directing users to pages answering frequently asked questions (FAQs). Offering consumers a friction-free experience helps to start the conversation and maximises the potential value of the website. Chatbots are ready to greet and respond to questions at any time and offer a simple and very scalable way to enhance relationships through conversational marketing. Chatbots can solve simple problems, although a human agent should be on hand to contact consumers when necessary.[43]

Chatbots can also be used on social media platforms. For example, Facebook Messenger chatbots answer and provide information automatically and provide marketing services for some of the world's largest brands. Facebook Messenger can send and receive text and images. It also can send greeting messages and prompt consumers to get started via templates that allow users to tap buttons to communicate with the chatbot. At present, there are more than 300,000 chatbots and 1.2 billion active users on Facebook Messenger,[44] so there is clear value in implementing chatbots to increase productivity and sales. Twitter is also suitable for chatbots because of its access to customer insights, traffic patterns and real-time data. A Twitter chatbot is ideal for companies to promote brands, increase sales and increase engagement with consumers. Twitter chatbots can perform certain actions automatically, including direct messaging, following, unfollowing, tweeting, retweeting and liking. A set of rules controls automation that broadcasts helpful information, replies to users and generates engagement through creative content.

RESEARCH AND RESULTS

A qualitative study was performed to investigate the use of chatbots at 15 companies in the retail industry. Table 1 summarises the important features of these chatbots. To find and select chatbots as samples, the study reviewed the investigations performed by such organisations as chatbots.org (https://chatbots.org/), *Chatbots Magazine* (https://chatbotsmagazine.com/) and *Chatbots Journal* (https://chatbotsjournal.com/). Forty chatbots were selected for the initial consideration. Finally, the 15 most outstanding chatbots were selected for further content analysis based on their performance and distinctive features.

The study revealed that chatbot-based conversational commerce has the following common features and applications:

- *Maintaining customer relationships*: Companies connect with consumers by using instant messaging on social media, eg Facebook Messenger. Companies

Table 1: The important features of the chatbots used by 15 selected companies

Company	Chatbot features	URL
Baidu	Melody is a virtual medical chatbot that facilitates an efficient and meaningful information flow between patients and doctors. Benefiting from natural language processing and deep learning capabilities, Melody communicates with patients interactively, asking them questions informed by AI to help them to articulate their symptoms. Melody then delivers the relevant information to doctors who can make informed decisions on treatment alternatives. Melody has piqued the interest of insurance companies, who see its potential as a sales and distribution channel for cross-selling health insurance	The chatbot is an iOS and Android app available in China only
Burberry	Burberry's chatbot helps users browse the company's fashion collections and provides suggestions with respect to putting together outfits, along with links to items on the Burberry website. The chatbot also sends push notifications to consumers to encourage them to shop different collections and provides access to unique branded content. The chatbot takes on more novel characteristics, such as booking an Uber ride to see brand exhibitions, finding particular stores and sending questions to customer services for human consultants to address via live chat.	https://www.messenger.com/t/Burberry
Co-op Insurance	The UK's first car insurance chatbot asks just four simple questions about the driver and vehicle to be insured. It then estimates the cost of the insurance by cross-referencing the user's answers with the information in its database, before directing the user to the full quote on the company website.	https://www.messenger.com/t/coopukinsurance
DuoLingo	DuoLingo is designed to help people learn foreign languages by encouraging users to have 'real' conversations with the various DuoLingo chatbots, each of which has its own personality. Students learn comprehension skills and vocabulary through both games and real-life scenarios, and are rewarded for achieving daily learning goals. The DuoLingo bots are equipped with AI to comprehend context and react to students uniquely, hence different users may receive different responses to the same query.	The chatbot is an iOS app
eBay	eBay's ShopBot uses AI to understand contextual information and predict purchase behaviours based on machine-learning capabilities. The chatbot asks questions to better understand consumer intent and make personalised suggestions. It learns from interaction with consumers, so the more it is used, the smarter it gets. ShopBot also allows customers to use photos as well as text to search for products.	https://www.messenger.com/t/251971398473021

(*continued*)

Table 1: The important features of the chatbots used by 15 selected companies (*continued*)

Company	Chatbot features	URL
H&M	H&M's KiK helps customers to navigate the store's inventory. The user tells KiK what they are looking for, and the chatbot provides examples of suitable products and other recommended items. To get a better idea about the customer's tastes, the chatbot will ask questions and then provide relevant style tips. For instance, if the user is looking for a dress, the chatbot will show them a complete, coordinated outfit and then guide them through the purchase process, should they wish to purchase right away, or let them save the suggestions for later. The chatbot also supports emoji-based communication.	https://www.kik.com/bots/hm/
IKEA	IKEA's Anna chatbot has been answering queries about products, opening hours and delivery policies since the mid-2000s. Anna can also speak a number of languages and answer simple personal questions.	https://www.chatbots.org/virtual_assistant/anna_sweden/
Lidl	Lidl uses a Facebook Messenger chatbot known as Margot to help customers with the wine selection process. Using conversational language, Margot can provide information about price, source and food matching. Margot understands both natural language and communication with emojis. The chatbot understands how users use language and can comprehend synonyms and different ways of asking the same query. In addition, Margot can respond to frequently asked questions, while users with more complicated queries may request to speak to a member of staff.	https://www.facebook.com/messages/t/lidluk
Microsoft	Microsoft created Zo as part of its work to develop conversational technologies. From 2016 to 2019, users could have one-to-one chats with Zo through a variety of channels, including Facebook Messenger, Skype and dedicated mobile apps. Zo leveraged machine-learning technologies to grow its knowledge base through interactions with users. Using conversational AI, Zo processed voice, image and text to develop its socio-cultural understanding, and could play games, tell jokes, chat about memes and celebrities, and even conduct deeper conversations. To keep Zo's knowledge base up to date, Microsoft used a variety of methods, including long short term memory neural network architecture.	https://twitter.com/zochats
Sephora	Sephora has two Facebook bots. The Sephora Reservation Assistant uses natural language to help customers make appointments at physical stores, while the Sephora Virtual Artist is a shade-matching bot that scans photos of celebrities and directs users to the products they can use to achieve the same look. Using targeted push notifications, Sephora builds its relationship with customers by inspiring them with new content.	https://bots.kik.com/#/sephora?ref=botlist

(*continued*)

Table 1: The important features of the chatbots used by 15 selected companies (*continued*)

Company	Chatbot features	URL
Tommy Hilfiger	Tommy Hilfiger's Facebook chatbot helps users to browse the Hilfiger collections. After asking questions on personal preferences (eg favourite colours) via a decision-tree format, the chatbot can offer more detailed styling advice. It can also filter the collections and suggest items that fit the user's style, before directing the user to country-specific website to checkout.	https://www.messenger.com/t/tom-myhilfiger
TransferWise	The TransferWise Facebook Messenger chatbot helps people in different countries transfer money to each other, providing updates and/or support as appropriate. The chatbot relies heavily on text-based messaging, which needs less coding and makes it easier to automate manual back-end operations.	https://www.facebook.com/wisebot/
Transport for London	Transport for London's TravelBot operates via Facebook Messenger. It provides users with Tube maps and service updates, such as diversions and when the next bus will arrive. When necessary, the chatbot can refer users to a member of staff. TravelBot learns from its conversations with users to become more accurate.	https://www.facebook.com/tfltravelbot
Shop Direct	The Shop Direct chatbot (Very Assistance) uses a conversational user interface to answer consumer queries via instant messaging. Customers who need assistance are presented with a number of questions and action options. Based on the customer's response, the chatbot can help with product selection by highlighting suitable products and offering style suggestions to provide a truly personalised experience. The chatbot learns via interaction, so the more it is used, the more useful it becomes.	The chatbot is an iOS app
Whole Foods	The Whole Foods chatbot supports food emojis and keywords so that users can search and browse its recipe database from their mobile phones and converse with a robot chef. The chat-bot can also direct users to nearby stores.	https://www.messenger.com/t/wholefoodsmarket

can discover more about a consumer's personal background by using a Facebook Messenger checkbox that automatically opens the user's profile when the consumer visits the company's Facebook page. Some consumers also give companies permission to send them messages in the future.

- *Engaging in conversation*: Company websites offer a very good medium for chatting with consumers. When a consumer visits an online store, he or she may ask questions about the product they are seeking, and the onsite chatbot can help to address such questions in real time. The company can personalise this chat experience and deliver messages according to the consumer's browsing history, purchase record, and what the consumer is currently looking for. By using conversational commerce, companies can automate conversations about product discovery and help consumers in the purchase process.

- *Providing useful information*: It is important to ensure that consumers know the status of their order and when their products will be shipped out. Chatbots provide a useful way to keep customers up to date with the status of their purchases.
- *Showing appreciation*: Companies should thank their customers for their business as a matter of course. With a chatbot, this process can be more meaningful and personable than with traditional e-mails. Continuing the conversation in this manner can strengthen the business–customer relationship in a natural manner, much like talking with a friend.
- *Confirming order*: Chatbots can reach out to consumers following the delivery of their order and request their feedback, whether in the form of a consumer review, information about their satisfaction, or pictures of the product in use. Chatbots can also recommend products according to consumer data and purchase record. When a consumer visits an online store and indicates their preferences, a chatbot can use this information to send the customer recommendations based on current trends.
- *Placing orders*: Chatbots can ask consumers whether they need to reorder products. For example, some kinds of products are purchased repeatedly, such as daily necessities and grocery items. By using consumer data it is possible to identify how frequently consumers purchase certain products and automatically prompt them about reordering.
- *Solving problems*: Chatbots are designed to solve consumers' problems and answer their questions. When consumers have questions about recently purchased products, conversational commerce can respond to them immediately with appropriate guidance and answers.

With the advancement of AI, chatbots can predict what consumers will buy based on their purchase history, and chatbots can take a proactive rather than reactive approach to communicating with consumers.[45] So that consumers do not feel they are talking to a machine, chatbots can converse with people using natural language (see Figure 3). Most social media channels can integrate chat functionality with chatbot capabilities. This creates an opportunity to get in front of consumers where they already are. In addition, the operational costs are relatively low for a company to launch a chatbot strategy and test its efficiency.[46] Consumers can get answers to their questions quickly and chatbots can perform fundamental frontline support tasks.[47] For instance, when a user asks a common question on shipping, a chatbot can readily understand the context and offer an FAQ article explaining the shipping policy.

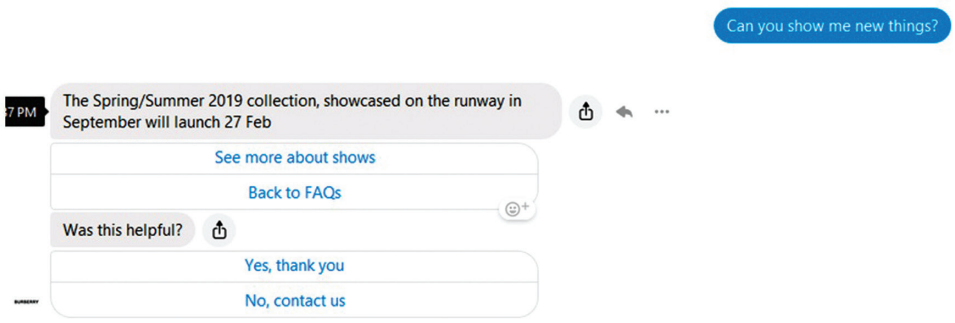

Figure 3: A chatbot capable of processing natural language

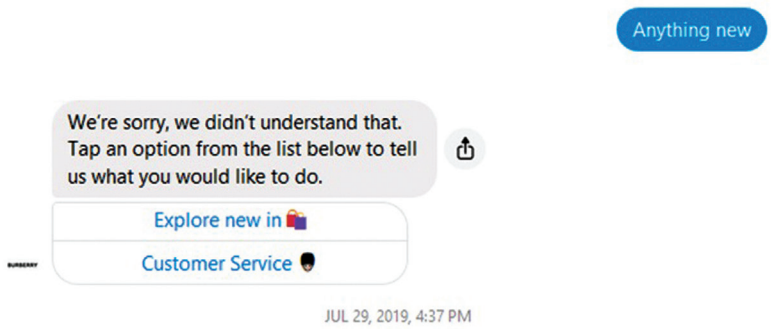

Figure 4: A chatbot incapable of processing a query

Chatbots use natural language processing and direct messages to converse with users and lead potential customers to what they are searching for.[48] Automation of the initial engagement with chatbots is highly scalable and helps to qualify prospects easily. Chatbots route consumers to find the information they need by asking qualifying questions such as 'Which products do you like? We sell A, B and C' or 'We have an article that provides you with more details. Do you want to read it?'. Chatbots can intellectually parse what a user has not completed and prompt call-to-action questions such as 'You did not finish the purchase. Would you like to continue?'. Chatbots can personalise a question and direct users to create a better consumer experience and the best way to purchase the product.[49]

Chatbots may not be ready to process everything (see Figure 4). In their simplest form, they function like automated telephone menus (eg press 1 for … 2 for …), which can solve a lot of common problems (see Figure 5). Even a cutting-edge chatbot may not be suitable for every business. Natural language processing makes chatbots smart, but they still require substantial investment. Simple chatbots are good for processing simple issues and helping consumers get started. Indeed, sometimes a lower-cost menu bot is quite sufficient to address the root of most problems.[50]

CONCLUSION

Chatbots offer a convenient way to assist customers with their choices and decisions — they reduce the need to schedule appointments with salespeople, and they minimise irrelevant noise in the course of the communication. Indeed, chatbot users can ask questions and obtain responses in a very straightforward manner. The value of chatbots is becoming more obvious and visible. The scalability and convenience of chatbots provide an enhanced experience for customers with valuable benefits for retailers. Chatbots not only provide answers to users' queries, but also integrate with users' data to personalise interactions with them. Based on these interactions, users can get reliable answers to customer service queries because the chatbot can identify when it needs to escalate queries. A chatbot can also increase the value of loyal customers. Promotions and information on new goods may be offered to customers through personalised messages. In this way, messaging services are valuable tools to develop and strengthen the relationship between customers and companies in a sustainable manner.

Chatbots deliver responses to requests based on AI technologies like machine learning and natural language processing. Some chatbots are single-purpose software that focuses on one function. These chatbots are task-orientated and generate automated

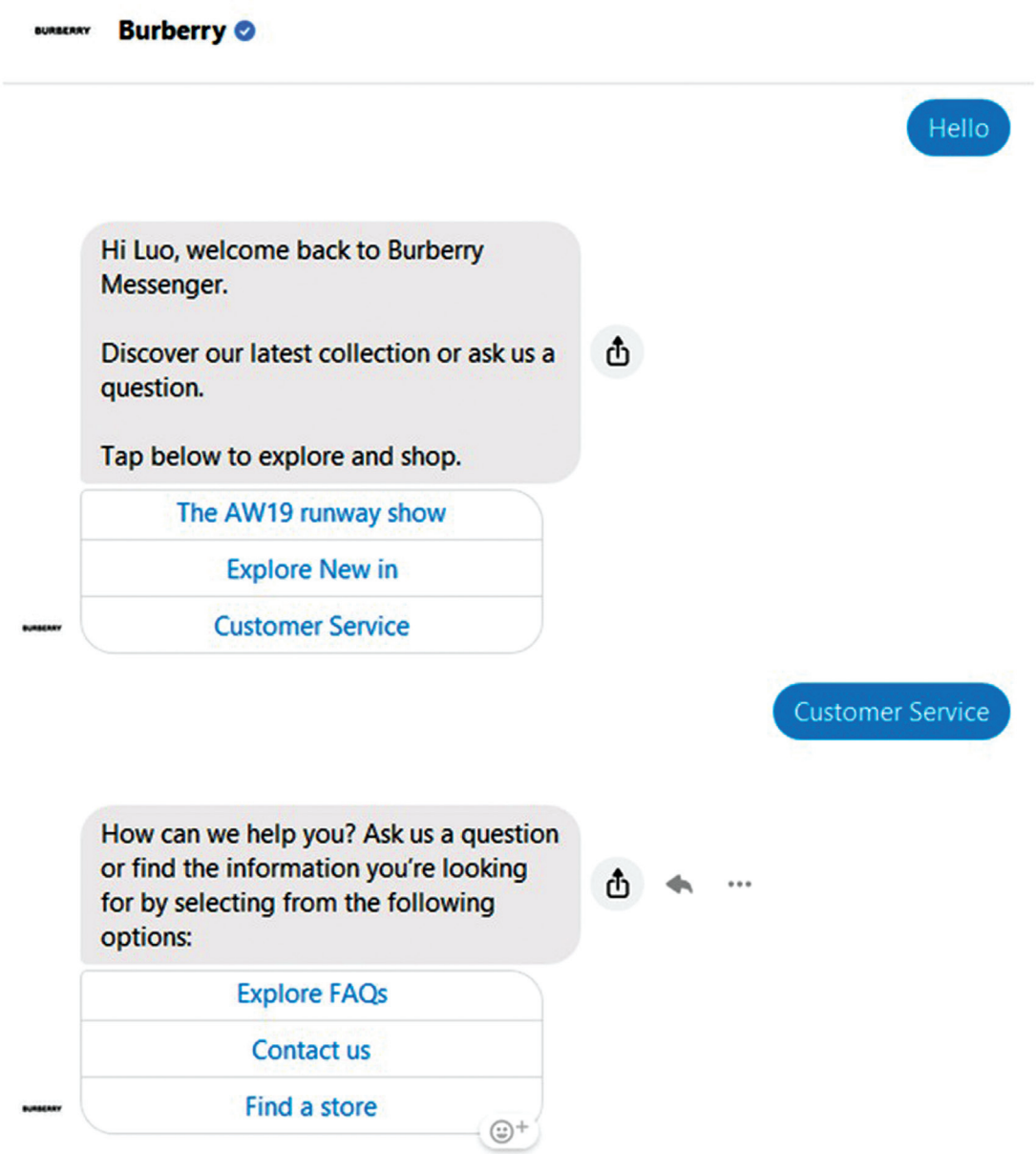

Figure 5: A chatbot using menus to communicate with users

responses to common questions, such as business hours. Advanced chatbots are much more personalised, interactive and sophisticated. They draw on predictive intelligence to analyse past user behaviours and user profiles to enable personalisation, and can learn users' preferences and offer recommendations. They monitor intent and data to initiate conversations.

Today's chatbots can not only process natural language, but also express themselves naturally, communicating in such a personal way that users may be unsure whether they are addressing a chatbot or a person. With the advancement of AI, chatbots can now offer rational answers to specific questions and perform complicated actions like buying and booking. In addition, machine learning

empowers chatbots to improve performance after the analysis of data collected from previous conversations. Chatbots can interact with customers better when they get more information from customers and learn to predict their behaviours and respond accordingly. The combination of AI and machine learning creates sensible chatbots that are more than simple assistants.

As technology evolves, the types of question (such as the status of an administrative procedure, financial information, or information on an order) that chatbots can process are increasing in complexity. Today's consumers demand flexibility and expect to be able to deal with their orders from their computers or smartphones. At the start of the purchase process, a customer identifies a need to buy products to fulfil his/her requirements. The customer visits the company website to look for information about available products. During this stage, the company should provide the right information with customised messages that change how the prospect considers the products. Chatbots can be used to present these customised messages to improve the conversion rate. At the decision stage, a tailored experience helps to decide the prospect in the company's favour. This may be as simple as allowing the prospect to have the first interaction with the company from his/her mobile phone, without the need for human communication. Furthermore, such conversations generate relevant information for sales and marketing teams for follow-up conversations. At the stage of intention, the automation of customer support can improve the customer's experience. For example, FAQs, tutorial videos and installation wizards provided by chatbots allow companies to offer constant and immediate assistance to customers. Chatbots can also administer surveys to collect consumer feedback in order to monitor customer satisfaction and make corrections when necessary.

Chatbots reduce costs while enhancing operational efficiency.[51] Chatbots offer value-added services and convenience to consumers. Chatbots allow companies to respond to consumers' issues and queries automatically without the need for human interaction. Setting up a chatbot can increase the service hours of a company and it can reduce the loss of prospects' contacts for a relatively low cost. Chatbots can work 24/7, freeing up human resources to process high-value added queries qualitatively. For example, a chatbot can engage with multiple consumers in a personal way, and this can be scaled up or down based on the business needs and demand. Chatbots can also provide human-like and proactive service to multiple users simultaneously. Chatbots enable a level of convenience and service that exceeds what human agents can provide. For instance, chatbots can process certain enquiries faster than traditional call centres. This helps companies to reduce the cost and achieve greater efficiency and also offers more benefits to consumers in the form of an improved experience. Chatbots are usually employed to deal with incoming communications and direct users to the relevant resources. They can perform various routine customer services, such as ordering tickets and comparing product prices.

Artificial intelligence is good at automating repetitive processes.[52] When it is incorporated into chatbots for such tasks, they often perform well. However, if demand extends beyond the software's ability, such as when questions and issues involve a larger number of variables, performance may lead to negative consequences for consumers and companies. Developers should add a contingency to the chatbot application in order to route users to other resources, like a human agent, or to prompt users for other questions or issues. Some applications may move through transitions between a human agent and a chatbot. Implementing chatbots allows companies to enhance productivity that generates savings. For instance, when

a company cannot answer its customers outside of fixed office hours, prospects are lost. Chatbots can now find answers for these customers. Without this service, the reliability and modernity of a company may be questioned. It is not necessary to employ human resources to process predictable queries when a chatbot can process the queries with a high satisfaction level.

Chatbots can not only process the requests of contemporary consumers, they are becoming a key part of the overall engagement and communication strategy. As customer bases continue to grow, chatbots are becoming the better option. This is having a deep effect on what customers expect of companies. The rise of AI technologies like natural language processing and machine learning has revolutionised the way customers interact with companies. Chatbots are the future of computer–human interaction. Businesses are moving to an AI-orientated digital world, where intelligent devices and agents are reshaping brand interaction and consumer engagement. Companies in the retail industry are encouraged to introduce chatbots to enrich the customer experience in the online environment and thereby foster engagement.

After qualifying users' preferences and their historical purchase data, chatbots can help with product selection. Chatbots can also provide lifestyle suggestions (eg recommending recipes based on the kind of food a customer has purchased). In a world where people expect instant responses across all touch points, chatbots offer products and services that resonate with consumers individually.

Like other AI technologies, chatbots can free humans to be more innovative and creative, and to focus on more complex problems. In the future, when AI is combined with network developments, such as 5G technology, companies and consumers will be able to enjoy improved chatbot features like more accurate predictions and better recommendations. These possibilities will evolve rapidly as internet connectivity, natural language processing and machine learning advance.[53] Sooner or later, consumers will be able to use fully functional chatbots to drive efficiencies in communications and the usage of services.

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