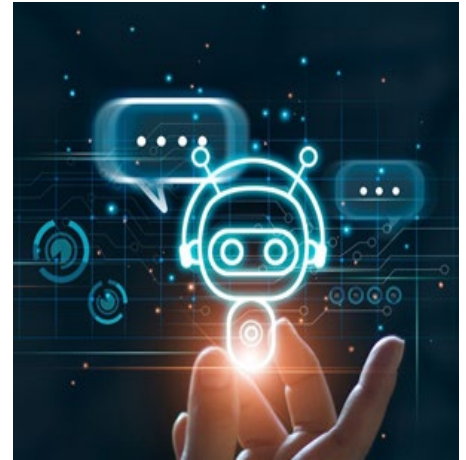


# Invasion of the Chatbots



How can I help you today? Thus begins your initial interaction with a chatbot. Most of us are familiar with the friendly little box that pops up on a website or mobile device app to offer help. It's also likely we have made selections from a speech-driven chatbot that directs our phone call to a department or person based on our responses to an initial inquiry. But what exactly are chatbots? How do they work? And why are they likely here to stay?<sup>1</sup>



## Introduction to Chatbots

A chatbot is a computer program or application that processes data provided by humans through typed text or speech, providing a means for humans to communicate with digital devices as if they are talking with an actual human. [1] Although chatbots can vary widely in their complexity, let's examine three common categories: (1) rules-based, (2) artificial intelligence (AI), and (3) live chatbots.

### Rule-based Chatbots

Rule-based chatbots can act based on Yes/No scenarios or through keyword recognition. These programs operate by using a decision tree or pre-defined playbook that allows the chatbot to respond to the user. [2] Figure 1 is an example playbook for a rule-based chatbot which shows how the chatbot selects a workflow to move the chat process forward based on a visitor's initial response to a question:

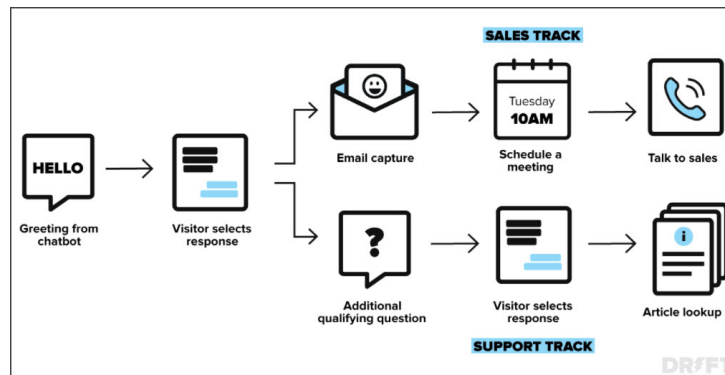


Figure 1. Rules-based chatbots are only as intelligent as the decision trees or playbooks that run behind the scenes like the one shown in this example.[2]

### AI Chatbots

AI chatbots can be complex programs that use a combination of Natural Language Processing (NLP) and artificial intelligence. This blend of technologies enables the chatbot to understand sentence structure as shown in Figure 2:

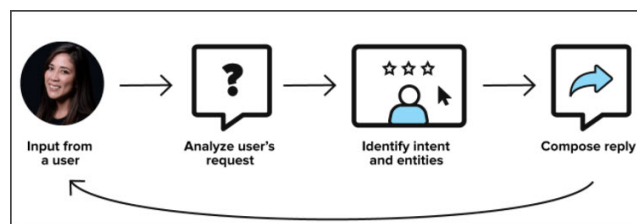


Figure 2. With the ability to understand sentence structure, AI chatbots add a layer of sophistication to the conversation experience.[2]

<sup>1</sup> The audience for this article mixture of non-technical and beginner-level technical individuals who have an interest in the basic workings of chatbots and how their use impacts consumers and business.

## Live Chatbots

Live chatbots work as a window for customers to use in interacting with companies. They work to connect the customers to a live person who can address issues.

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## History of Chatbots

As early as 1950, long before the advent of personal computers and the invention of mobile technologies, Alan Turing considered whether a person could interact with a computer program while being unaware that they were communicating with a non-human entity. This idea is now known as the Turing test. [3] Still, it wasn't until 1966, at the MIT Artificial Intelligence Laboratory, that Joseph Weizenbaum created the first chatbot named Eliza. Chatbot technology has only continued to grow and evolve since that time. [4]

Today's chatbots are often quite sophisticated and have many practical uses such as:

- Tracking customer or employee satisfaction
- Performing customer service tasks by responding to questions
- Booking flights, hotels, and other items
- Informing citizens of emergency or public health situations
- Ordering restaurant takeout [5]

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## A Mixed Bag of Reviews

Consumers and businesses see the benefits of chatbots from different perspectives. Consumers continue to prefer human-to-human interactions, but companies see chatbots positively due to their cost-effectiveness.

### Consumer Perspective

According to a recent survey of 415 respondents conducted by Userlike.com, 80% of respondents had previous interaction with chatbots. Of the respondents who had never used a chatbot, over 75% of them were over the age of 45. [6] This finding suggests that age plays a role in the use of chatbots. While most respondents were willing to interact with a chatbot, the preference was that the chatbot forward them to a human agent, even if that created a wait time.

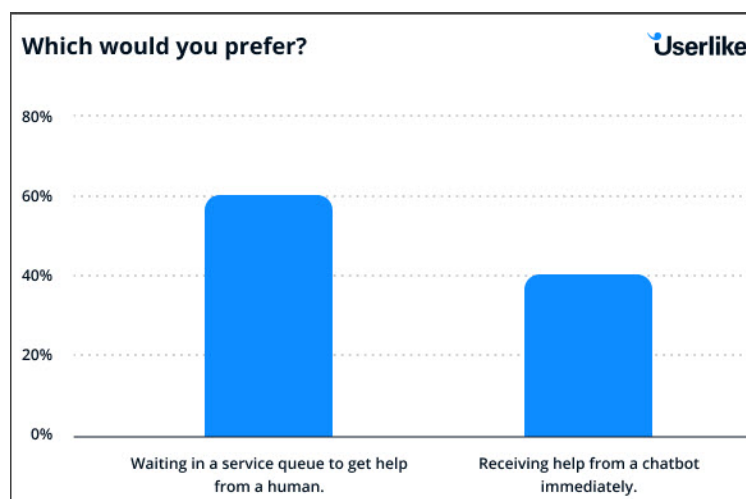


Figure 3. Recent survey results indicate that customers prefer waiting for a human agent versus receiving immediate help from a chatbot.[6]

Respondents of the survey noted both positive and negative aspects of using chatbots.

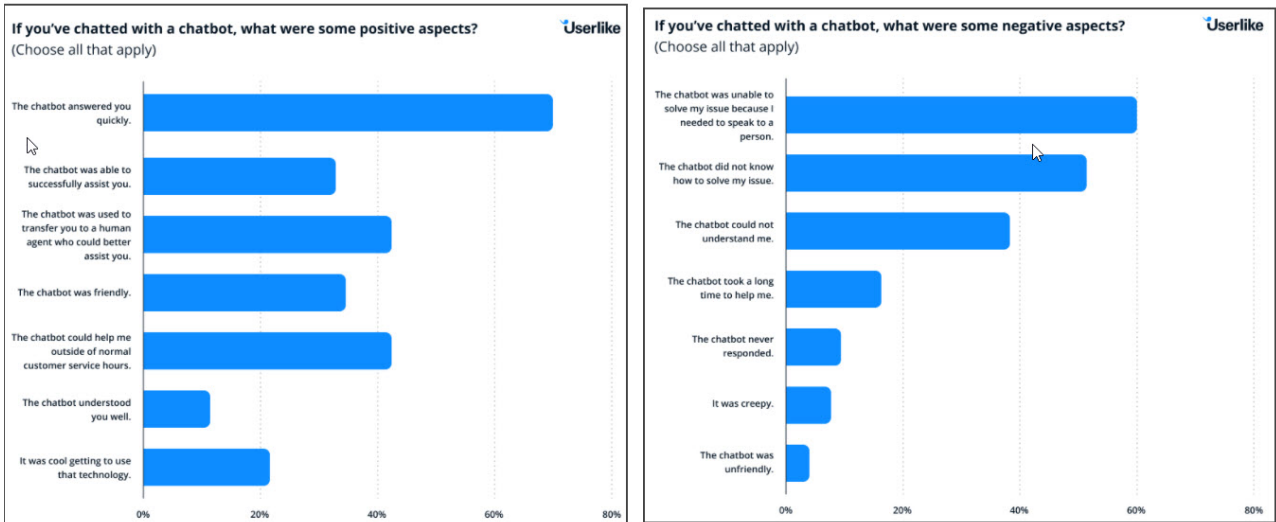


Figure 4. Consumer survey results measuring positive and negative aspects of chatbox use.[6]

### Business Perspective

From a business perspective, there are two main incentives for using chatbots: (1) scale, personalization, and proactivity, and (2) cost savings. Chatbots allow businesses to scale up portions of their operations to a level they cannot reach using traditional human-only models. When a business relies solely on human-to-human interaction, it is limited in the number of people to whom it can provide service at one time. This limitation forces companies to rely on standard business models alone. Chatbots alleviate some of these constraints by allowing businesses to upscale their services to assist millions of people simultaneously while using a human-like, personalized, and proactive service. Chatbot usage can provide cost savings for businesses by a reduction in salary expenses. The chatbot removes work from human employees, freeing them to pursue other tasks. Additionally, because the chatbot streamlines the workflow, fewer human employees are required. [1]

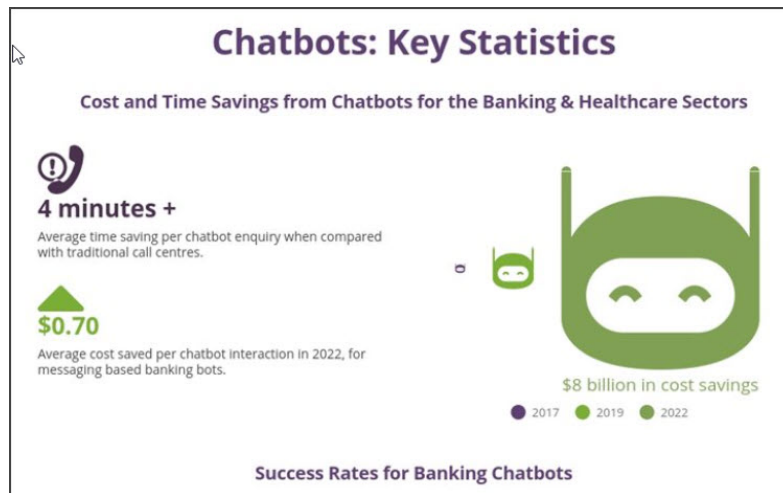


Figure 5. A projection of savings for companies in the financial and healthcare.[7]

### Future of Chatbots

Due to their cost-effectiveness and ease of use, chatbots are here to stay and should only improve over time. Eventually, everyone should have the ability to have a personal assistant within easy reach. There are already plans to integrate AI with 5G technology. Research is underway to examine how this integration will further enhance chatbots. Future chatbots based on this technology change will provide greater response time and possible access to high-definition video during a chat conversation. [1] The invasion of the chatbots continues.

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