

The logo for Crow Canyon Software, featuring the company name in a white sans-serif font with a stylized wave icon to the left of the word 'Software'.

Crow Canyon
Software

A background image showing a close-up of a circuit board with a glowing blue wireframe 'AI' graphic overlaid on it. The circuit board has various components like capacitors and a component labeled 'YBJG 952134'.

CHATBOTS: THE FACE OF AI

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The growth of chatbots in the last few years has been stunning, and there is no sign of it slowing down. The global chatbot market is expected to reach \$1.23 billion by 2025, a compounded annual growth rate of 24.3%.¹ On top of that, 1 out of every 4 people in the entire world (1.75 billion people) will be using mobile messaging apps by 2019.²

Either you, or someone you know, has likely had a conversation with a chatbot fairly recently.

Chatbot conversations have rapidly evolved as the underlying technology -- artificial intelligence, big data, and machine learning -- has improved. Gone are the days of stilted "Hi, what's your name?" greetings -- consumers, especially millennials, are now relying on chatbots to get things done. Studies show that 26-to-36 year olds are now willing to spend up to \$675 via a chatbot interaction³ with 48% of millennials willing to receive recommendations or advice from automated chat partners.⁴

The popularity of chatbots with businesses is even more significant. Three out of every four companies are planning to build their own chatbot, with 80% of organizations claiming that they already use (or plan to use) chatbots by the year 2020.⁵

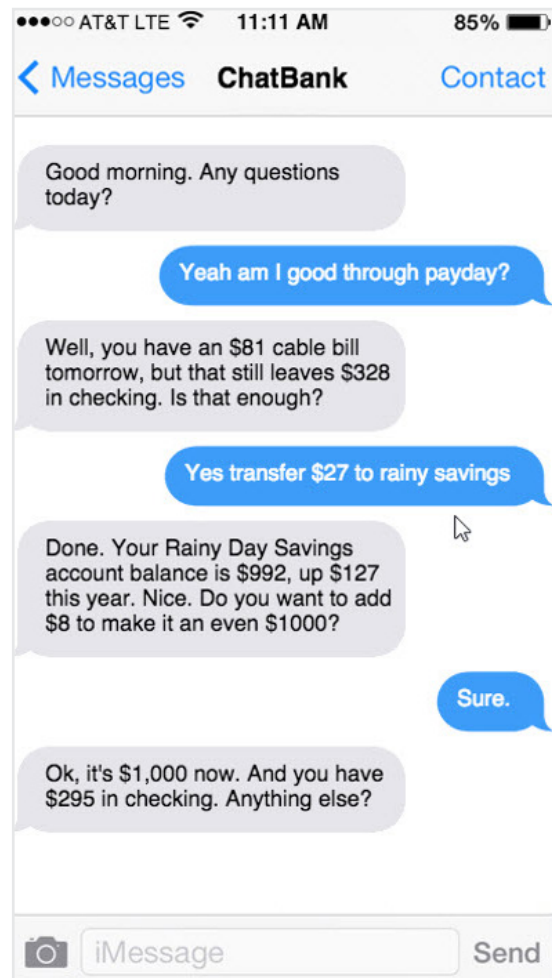
So why are chatbots so popular? What is it about this technology that has inspired both businesses and customers to pursue automated conversations in lieu of human-to-human discussions?

The chatbot phenomena is riding the perfect storm of an attuned customer base raised on electronic communication, technology that is reaching new heights, and corporations eager to turn affordable tools into profitable solutions.

Customer Service Redefined

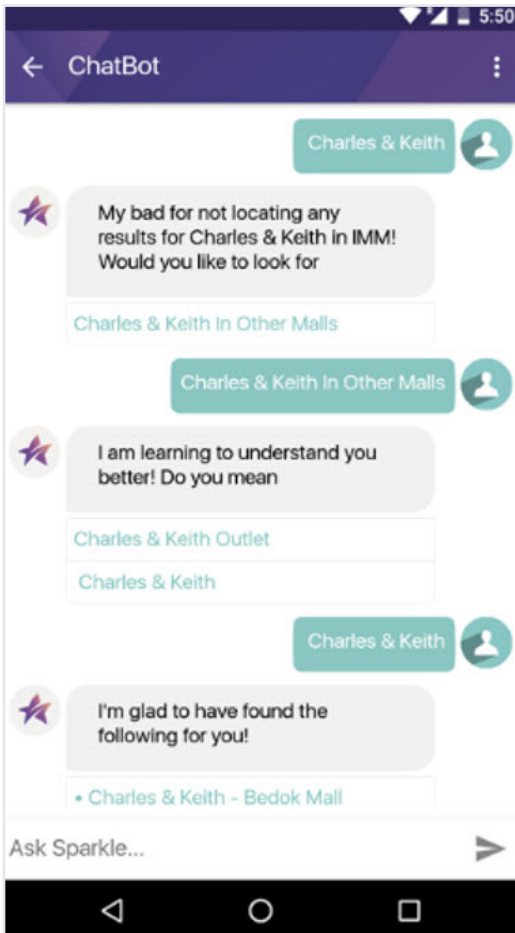
More than other sectors, the customer service industry relies on relationships. How people request, discuss, and share information has always been critical to how successful an organization's customer service initiatives are. The big difference now is that one half of the relationship is often comprised of a non-human conversationalist.

Chatbots have a special place in customer service -- this is an environment based entirely on conversations, offering support, and providing detailed information.



Currently, chatbots have not fully taken over the customer service desk, but are playing a supportive role in the following ways:

- **Carrying the Repetitive Load:** A majority of customer service questions are highly repetitive. Organizations without chatbots need to spend money on employees that are dedicated to answering the same redundant questions, over and over. Many enterprises cut costs by outsourcing their help desk to overseas call centers, but the cost of a chatbot is still more affordable than this oft-preferred option;
- **Assisting the Human Support Team:** Another repetitive task is retrieving customer information, such as the details for a service request or contact details for a customer complaint. Chatbots are able to collect all of this information and then pass it on to support agents when needed; and,
- **Always On, 24 x 7 x 365:** Prior to chatbots, organizations relied on either hiring local support teams or using geographically distributed teams to handle customer queries across different times & regions. Chatbots, however, have no such constraints and can operate regardless of time and location. Need Mandarin-speaking support techs available at 3am? Simply integrate the applicable API.



A Win-Win Scenario

Chatbots have appeared at a time when the majority of users (i.e., 26 to 36 year old millennials) actually prefer the anonymity and instant response time of chatbot technology. Nearly 65% of millennials prefer to go online to get support compared to speaking with in-store staff; additionally, one out of every five customers view chatbots as the easiest way to contact a business.

As technology improves, experts anticipate that these metrics will increase and the “artificial” in AI will become diminished over time — the more “human-like” chatbots can become, the more customers will be inclined to use them. Google’s Director of Engineering, inventor Ray Kurzweil, asserts that humans and chatbots may become indistinguishable from each other by the year 2029.

While young consumers may be keen on using chatbot technology, nothing can match the eagerness of companies to provide low-cost support alternatives that their customers may actually prefer.



Some key benefits that companies enjoy from deploying chatbots include:

- **Productive Re-allocation:** Given today's technology, chatbots excel at providing first-level support. A majority of support questions are redundant and require little in the way of verbose conversations and data retrieval. By using chatbots, organizations can re-allocate their first-level support and customer service teams to more productive activities, such as documentation maintenance, customer service improvement, and improving the customer engagement experience.
- **Increased Revenue, Decreased Costs:** According to McKinsey, companies are saving as much as 29% on customer service by deploying chatbots.⁶ Real-world examples abound, with Amtrak reaching 800% ROI, increasing bookings by 25%, and answering over 5 million questions via its "Ask Julie" chatbot deployed in 2012. Another success story is open-source database creator MongoDB — after just 3 months, the company's chatbot resulted in a 70% increase in leads and a 100% increase in total messaging responses. In addition, the delivery company 1-800-Flowers increased its revenues by 6.3% to \$165.8 million after adding a chatbot, Gwyn.⁷
- **Customers are Not Kept Waiting:** The customer service industry is particularly sensitive to the topic of waiting times. No one likes to be kept waiting, especially when the customer may already be frustrated or annoyed with a service provider. Chatbots optimize the customer experience by providing immediate information to the requester. Providing good customer service doesn't hinge solely on timeliness; the answers provided must be relevant to the question asked. These two factors can make or break a relationship with a customer.
- **Intelligent Transfers:** As AI technology improves, chatbots are starting to include internal analysis in their machine learning algorithms. Modern chatbots enable organizations to define a Confidence Score threshold — this is a benchmark score that the chatbot uses to determine if a question should be answered or transferred to a live support agent. When a customer asks a question, the chatbot will determine the most appropriate answer and will then assign a Confidence Score to that answer. If the score is below the threshold, the question will be automatically transferred. If, however, the score is above the threshold then the chatbot will proceed with answering the customer's query.

AI Technology for the Masses

Not that long ago, the development of chatbots was the arena of data scientists and application developers. Though the concept of AI has been around since the mid-1950s, it is only in these later years that AI-associated technologies — such as big data and machine learning — have advanced to the stage where artificial intelligence can be fully developed. For the most part, chatbot development was limited by both the technology and the expertise to scale its progress.

As technology has advanced, the big players in IT have stepped up to facilitate the democratization of both AI and chatbots. At the forefront of this effort is Microsoft and its developer-friendly platforms, the Microsoft Bot Framework and Azure AI. The former enables developers to build, connect, deploy, and manage intelligent bots that can interact with users across a variety of apps, such as Facebook Messenger, Slack, Teams, Skype, and Cortana. Comprehensive guidelines explain how to use the Bot Builder SDK to craft customized bots and then use the Bot Framework to connect bots to channels.

This effort plays a key role in the democratization of chatbots and AI in general. By making the technology accessible and available to the entire developer community, the cost of bot development decreases. As costs decrease, more organizations can take advantage of bot technology. This cycle of development, fueled by democratization-based policies, empowers enterprises to build their own big data sets and ultimately contribute to the further refinement of machine learning and artificial intelligence.

At the moment, the democratization of chatbot technology is aimed at the development community. Over time, frameworks will mature to the point where non-developers — and even non tech-savvy individuals — can build out their own machine learning models by simply conveying an end-goal. Knowledge of data science terminology and concepts will be unnecessary. Whether this is a good or bad thing is up for debate, but the march of technology towards simplicity and accessibility will continue on unabated.

Challenges of Chatbot Technology

We've discussed many of the benefits that surround chatbot technology, but to be fair we must look at the challenges as well. The primary obstacles involved with using chatbots are its technological limitations and dealing with customer retention.

The technology underlying chatbots is still evolving. Several issues come from the lack of sufficient processing capability. It is likely that these limitations will be addressed as the technology advances; for now, however, organizations may need to deal with the following:

- **Irrelevant Responses:** The chatbot may not fully understand a customer's question, which will result in an inaccurate or irrelevant response. This is largely due to technological restrictions involved in understanding the complexity of human language. Part of this stems from the data input: is slang being used? Are questions rife with misspellings and/or grammatical errors? Conversely, an AI framework may understand perfectly typed English, but can it comprehend dialectical variations used in different geographies? Can it understand non-Latin languages, such as Japanese and Thai? How about sarcasm or other nuances of language?
- **Chatbot Quality:** Like anything in life, quality at an affordable price can be hard to find... and chatbots are no exception. Remember, relatively speaking, this field is in its infancy. A whopping 54% of developers worldwide worked on chatbots for the first time in 2016⁸ — so the majority of developers have less than a few years of experience creating AI-powered chatbots. A top-of-the-line chatbot may be more than capable of understanding

customers and making a positive impact on the bottom line — an average run-of-the-mill chatbot, however, may leave customers more frustrated than satisfied.

- **Customer Retention:** This metric is a measurement of how likely the customer is to remain in a conversation. While not applicable to customer service scenarios—where the customer has a vested interest in completing a bot-based inquiry—other industries rely on chatbots to maintain the customer’s interest in order to make a sale or promote a product. Given the sparse attention span of Internet users, this can be a challenge — according to Chatbots Magazine, 40% of consumers leave a conversation after the first message while an additional 25% drop off after the second text.⁹ This can be addressed by proactively improving the engagement capabilities of the chatbot and using AI/machine learning to make the conversation highly relevant from square one.

No Turning Back

The statistics from the corporate analysis of chatbot usage just keeps rolling in:¹⁰

- **Snap Travel:** \$1,000,000 in bookings thanks to its chatbot.
- **KLM:** Increased customer interactions by 40%.
- **Chase:** Saved over 360,000 hours of manpower.
- **Sweedbank:** Their chatbot, Nina, handles 40,000 conversations per month.
- **Asos:** Increased orders by 300% using Messenger chatbots.

And so on with many other companies.

Chatbots have rapidly moved from being an odd curiosity of little real value to game-changers in their own right. Back in the early days, people had mixed emotions: concerned about the ethical implications of perceived unemployment arising from machines, yet excited about the prospect of intelligence arising from a man-made creation. It turned out that neither fear was rooted in fact.

The essence of chatbot technology is being able to understand input (human language) and provide output (a response or action). Although assigning intelligence to a computer program is a bit of a mental leap, that doesn't devalue the critical importance of chatbots in today's IT landscape.

Chatbots have not only provided companies with an effective means to engage with today's millennial customers, but have played a role in the democratization of artificial intelligence to the masses. Chatbots have become the face of AI, bringing advanced technology from Silicon Valley labs to your neighbor's home office. Developers, regardless of AI experience, have been provided with the tools they need to further refine this technology, still in its infancy.

Ultimately, the Google futurist Mr. Kurzweil may be proven right: chatbots may become indistinguishable from humans within the next 10 years. Whether that bodes good or bad for society is still to be determined. But, by all accounts, it is the reality that awaits us.



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