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AI Chatbots: Key Benefits and Challenges for Businesses

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Abstract. *Chatbots have the potential to become a relevant tool for businesses, revolutionizing customer interactions, automating repetitive tasks, and improving overall engagement, powered by Artificial Intelligence and Natural Language Processing. Existing research highlights their deployment across industries, mostly in optimistic terms. This paper offers a thorough examination of chatbot integration, looking at both its advantages and disadvantages. We evaluate the changing role of chatbots in business using a qualitative research methodology that includes case studies, secondary data analysis, and web scraping of Fortune Global 100 businesses. Our research shows that although chatbots increase productivity, enhance customer loyalty, and support data-driven decision-making, they also have drawbacks, such as trouble answering complicated questions, privacy issues, and moral dilemmas. Furthermore, our study reveals sectoral differences in chatbot adoption, with manufacturing and commodities being cautious while sectors like finance and retail are setting the standard. The study also looks at chatbots' use in crisis management, demonstrating how well they work in digital security and humanitarian assistance. Notwithstanding current constraints, chatbot capabilities can be improved by ongoing advancements in natural language processing (NLP) and AI ethics. This study offers important insights into optimising chatbot adoption and striking a balance between automation and human oversight to guarantee dependable, transparent, and adaptable AI systems by highlighting best practices and areas for improvement.*

Keywords: Chatbots, Artificial Intelligence, Customer Engagement, Automation, Natural Language Processing.

Introduction

With the accelerated development of hardware and software, artificial intelligence (AI) is expected to foster a new era of human civilization and change the world. This is a claim that is presented more and more in press and by politicians around the globe (Akhtar, 2023), and even shared by the Managing Director of the International Monetary Fund (Georgieva, 2024). A significant part of the AI development is represented by Intelligent agents, capable of performing a wide range of jobs, from manual labor to complex processes. As a result, the economic potential of AI is tremendous,

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expecting to reach 1.3 trillion USD by 2030, from 0.2 trillion USD in 2024 (MarketsandMarkets, 2024) and many business owners perceived AI as a great tool to improve customer experience (Haan & Watts, 2023). Only by the end of 2024, chatbots are expected to save businesses up to 2.5 billion hours of work. This time-saving comes from their ability to handle routine tasks such as customer inquiries, order processing, and appointment scheduling, allowing human employees to focus on more complex or value-added activities. Overall, the efficiency provided by chatbots has the potential to drive productivity and reduce operational costs for businesses across various industries. However, most AI solutions are still in their infancy and have yet to prove their profitability in an era often described as the 'AI Bandwagon,' representing a gamble for many startups and established companies. More than that, the adoption rate is expected to sky rocket. In a survey conducted by the IBM Institute for Business Value in collaboration with Oxford Economics, in May 2023, only 42% of organizations were using generative AI text-based chat bots with customers. This number was expected to increase to 84% by the end of 2025. Similar trends were expected for generative AI-powered voice conversations with customers, increasing from 27% of organizations to 75% by 2025, or outreach where the adoption rate of gen AI was 33% in May 2023, and 81% plan to do so by 2025 (IBM Institute for Business Value, 2023).

Therefore, research on the development of AI solution is needed to clarify the current state of the industry, and how optimistic the society should be about the AI "revolution".

Literature Review

One of the most common forms of intelligent Human-Computer Interaction (HCI) is a chatbot, which is a classic example of an AI system (Bansal & Khan, 2018). When prompted, the AI chatbots use NLP – natural language processing, and machine learning to analyze, recognize, understand and generate back responses. (Akpan, et al., 2025) Not each model has AI algorithms embedded but state of the art chatbots do. These constitute the newly generation of AI-powered chatbots which provide a broader level of functionality and understanding of sophisticated queries and users' common questions. They are helpful in fields including e-commerce, business, education, and information retrieval (Shawar & Atwell, 2007). Because chatbots have the potential to deliver many benefits to users, such as improve customer engagement and brand loyalty, reduce operational costs and boost efficiency, capture customer data directly, running test, and many more (IBM, 2024), they became a relevant business investment. The majority of implementations are instantaneously accessible to users without the need for installs and are platform-independent. Even if computers and software proved that they can complete some tasks significantly more accurately, quickly, and consistently than humans, till recently, these systems were limited by their need for clear, comprehensive instructions on how to convert inputs into outputs in order to function well. Engineers were codifying clear tasks and instruction for the software do follow. However, many tasks including, evaluating data, understanding human behavior, finding new patterns, adapting to unclear customer requests, have thus far eluded automation because they depend on implicit knowledge (Autor, 2014). Unlike conventional computer programs, machine learning (ML) algorithms infer instructions from examples rather than needing explicit instructions to operate. This capability demonstrates a crucial, unique feature of machine learning systems: they can learn to carry out tasks even in the absence of instructions, including those that call for tacit knowledge that was previously only acquired by lived experience (Brynjolfsson & Mitchell, 2017). Chatbots can also take the form of voice bots, AI-powered assistant that processes human speech using speech-to-text and text-to-speech algorithms. E.g, in a business meeting, the bot can take orders by converting the customer's spoken words into text, generating a text-based response, and converting

that response back into speech, providing a human-like interaction, meaningful processing, interpretation, and response to users' voice.

Gartner's Magic Quadrant for Enterprise Conversational AI Platforms, displayed in figure 1, provides a structured evaluation of the top chatbot providers, categorizing them based on their execution capabilities and vision for innovation, which are two critical factors in determining how well these platforms support businesses during crises (Rigon, et al., 2024). By categorizing market leaders and emerging players, the quadrant framework highlights strengths and limitations, helping assess their real-world impact on business continuity and resilience.

Figure 1. Magic Quadrant for Enterprise Conversational AI Platforms

Source: www.gartner.com.

The report highlights leaders such as IBM, Kore.ai, and Cognigy, which have established themselves as reliable and scalable solutions for enterprises needing robust response tools. These platforms excel in delivering precise, AI-driven communication that adapts to dynamic situations. Challengers like Amazon Web Services and Yellow.ai offer competitive chatbot solutions but require further refinement to enhance integration and efficiency. Meanwhile, visionaries such as Google and Omilia focus on pushing the boundaries of conversational AI, introducing new capabilities that could redefine chatbot interactions in the future. On the other hand, niche players like Aisera and Sinch specialize in specific AI-driven solutions but lack the broader scalability required for full-scale enterprise adoption.

Although chatbots increase automation, their full potential necessitates human-AI cooperation and calls for cautious implementation to address moral dilemmas and workforce adaptation challenges (Durach & Gutierrez, 2024). This issue arises from chatbots using predictive methods instead of using real understanding to create content. This frequently results in the creation of information that sounds realistic but is actually false or contrived (hallucinations). Therefore, organizations are advised to balance efficiency gains from chatbots with the risk of spreading misinformation (Hannigan, et al., 2024). Moreover, some researchers highlight that AI should

enhance human decision-making rather than replace human oversight (Mosqueira-Rey, et al., 2023), which can limit the potential of chatbots.

Methodology

This study takes a qualitative, exploratory approach to the adoption of chatbots and their business impact. The research is structured around three key pillars: secondary data analysis, case study evaluations, and primary research through web scraping of any available information on chatbots adoption by Top Fortune companies to determine the adoption rate across top companies. The secondary data analysis is based on reports from major technology firms, surveys, and market research studies to quantify chatbot adoption rates, and the impact of automation on operational efficiency. To better illustrate real-world applications, a case study approach is used to examine companies that have successfully implemented chatbot solutions and their learning. For the data collection and crisis management, the case studies were choose based on novelty of insights and exceptionality, to understand the emerging trends. For chatbot adoption, case studies were chosen based on common industry trends or the average chatbot implementation. In order to assess the chatbots case studies, Gartner's Magic Quadrant framework was chosen for its industry-recognized evaluation of chatbot platforms, providing insights into their scalability, adaptability, and effectiveness. Gartner's Magic Quadrant is a research methodology that evaluates vendors in a particular market based on two key dimensions: ability to execute (measures how well a solution performs against its vision) and completeness of vision (how innovative and forward-thinking a solution is). Solutions are placed into one of four quadrants: leaders (high execution and strong vision, with established customer bases and high adoption), challengers (strong execution but may lack innovation or a future-proof strategy), visionaries (innovative and forward-thinking but may struggle with execution or market presence), and niche players (Specialized solution focusing on a specific segment or use case but lacking broad adoption.

Four key directions for the research were selected based on their recent popularity and industry potential. The first 2 directions are related to the development and impact on the labor market of enterprise chatbots and the second is the adoption rates of those chatbots. The third direction is data, because it is at the core of developing AI models and a key commercial currency for businesses. The last direction is related to the use of chatbots in crisis management in the overall context of political instability, military conflicts, natural disasters, or cybercrime.

Results

Enterprise chatbots development

As technology improves, companies are gazing for an AI-powered tool that simulates human conversation for the scope of providing instant, 24/7 support across platforms while establishing connections with backend systems to provide tailored support. Such technology is expected to be developed into autonomous AI agents with the ability to comprehend intricate conversations and react similarly to human agents thanks to the power of generative AI.

In the traditional way of working with human resources, businesses are limited by office hours, holidays, different time zones, rotation of personnel, lack of motivation, unstandardized quality of responses by different employees, difficulty to recall past interactions, limitation during busy hours. For employees, consumer-oriented work is frequently described as challenging, mostly from midnight shifts, unpleasant treatment from irritated customers, repetitive work, and a lack of career opportunities. For mitigating all those setbacks, companies invest in developing chatbots

that can react instantly, cut down client wait times, and increase customer satisfaction by personalization, including multilingual communication, in contrast to human agents. Such outcomes can be achieved by enhanced access and use of data, including account information, preferences, and past purchases, to customize their recommendations and responses. Unfortunately, existing data is rather unstructured, mostly consisting of recorded calls that need to be tagged and properly analyzed before being fed to the algorithms as training material. Therefore, before learning from past conversations, which will improve their accuracy in an iterative learning curve, proper investments in databases are required. An example is research conducted on 5,179 customer care agents that examined the phased rollout of a conversational assistant based on generative AI (Brynjolfsson, et al., 2023). The AI system monitored customer chats and provided real-time recommendations on how to respond, intended to support agents, who were still in charge of the discussion and were free to disregard suggestions. Having access to the tool boosts productivity by 14% on average, as indicated by the number of issues fixed per hour. This benefit is 34% for inexperienced and low-skilled individuals, but it had little effect on experienced workers. Meanwhile, an unspoken conclusion of the study is that the model learning curve was limited by data points from experienced workers, and a glass ceiling could appear in the development of chatbots that only suggest responses that are validated by human personnel. Based on this analysis, to reach the potential of enterprise chatbots, only a machine-learning, autonomous approach should be preferred. If the model can learn by iterative testing while validating responses based on sentiment analysis during the interaction and user satisfaction surveys after, then the expected outcome of delivering better results than humans is more likely to be achieved.

On the employees' side, one of the main concerns when a new technology is introduced is concerning the risk of job cuts produced by the increase of productivity or automatization of existing tasks. The 2025's Future of Jobs Report by the World Economic Forum highlighted that 41% of companies globally plan to reduce workforces by 2030 due to AI because skills are becoming less relevant or some roles are no longer needed (WEF, 2025). Till 2023, this trend is yet to be seen in customer support optimization. Employment data from the International Labor Organization, a United Nations agency, shows that the number of people employed on one key ISCO-08 code for customer support roles, 42 - Customer services clerks, is not decreasing but on an ascending trend after the Covid-19 pandemic. The analysis was conducted on data from 96 countries that provided reliable and continuous data to ILOSTAT. Their total population is approximately 5 billion. The most notable missing countries are China, Japan, Canada, South Korea, North Korea, Venezuela, Madagascar, Nepal, Yemen, Sudan, and Mozambique. Where data was missing, estimations were made by the author using an average between the following and previous years. Where missing, the past value was used as an estimation to not affect the evolution pattern.

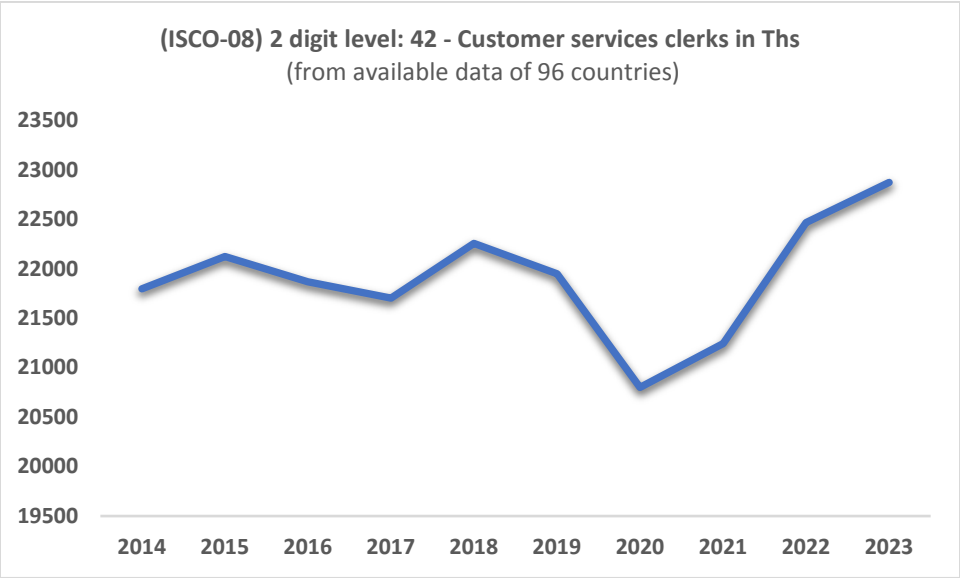

Figure 2. Employment in customer services

Source: Authors' own research, data from ilostat.ilo.org.

Not only that the number of employees in customer support did not decrease so far, but in a global survey of 3,736 employees between August 23rd and September 14th, 2024, commissioned by Monday.com, customer support is lagging behind in departments using AI at only 40% (Monday.com LTD, 2025). Based on existing data, the employment in this sector is at an all-time high, and only the pandemic period (2020-2021) showed a high correlation in terms of redundancies. Based on the high churn rate in the sector and the need to train and review the AI chatbots models, even if the sector will fully embrace autonomous AI technology, the trend may incline to not hiring new employees after the current workforce quits rather than making layoffs. On the other hand, the estimation by WEF can have a dramatic impact in terms of available jobs. Taking into account that most missing countries are rather undeveloped, with a small exception such as Japan, Canada or South Korea, and such jobs are usually outsourced to undeveloped countries, it is safe to assume that a proportional amount of employees are presented. Therefore, we can estimate the total number of employees according to ISCO-08 code 42 - Customer Services Clerks, is 36.6 million employees. The WEF is expecting that around 20% of such jobs to be displaced and around 16% to be created. Therefore, 7.3 million jobs will be displaced and replaced by similar jobs that require AI, outsourced to other countries, or dissolved. Compared to jobs such as postal service clerks, bank tellers, data entry clerks, or cashiers that are expected to reach a total negative net growth of more than 20%, customer service clerks are rather safe in terms of dissolved jobs. From this perspective, global entities are rather expecting incremental improvement in chatbot development and not a technological breakthrough that will create fully autonomous enterprise chatbot services. This observation is backed by the exiting employee data presented in figure 2. Therefore, it is yet to be seen what will be the correlation between customer support adopting AI to boost service quality and loss of employment in the sector.

Internal operations chatbots

We conducted an exploratory study based on web scraping analysis to determine the use of chatbots in Fortune Global 100 (extended to 105 companies). We used publicly accessible sources to look

at and determine how AI is used by the most valuable companies, which are regarded as trendsetters and employ over 26 million people. To gather data, we performed repetitive requests on the ChatGPT platform to identify the AI use case implementation for each company in the top 105 Fortune Global. The resulting data consisted of the identification of AI use cases for each company and the web sources. Sample crosschecks with indicated sources were performed to validate the AI findings (we read the sources to confirm the findings). There were 578 references, from companies' official sites, newspaper articles, and reports related to AI projects of those companies. A list of top fortune companies was downloaded from Kaggle.com and compared with the Fortune.com official site.

Then, in order to determine which entity had integrated chatbots into their operations, we performed content and thematic analysis of the collected raw data. We considered as chatbot utilization the reference of implementing dedicated chatbots (for specific activities) or the implementation of global copilots, such as Microsoft Copilot. Then, we clustered companies by industry (based on the main activity reported by the corporation) to understand sectoral adoption tendencies.

he analysis revealed that 56% of companies use AI chatbots for increasing productivity. productivity. According to sectorial analysis, chatbot adoption is high in industries with a high volume of clients or service providers, while on production, usage of AI is oriented towards improving equipment efficiency. We clustered data into industries with a high chatbot adoption rate (≥ 50% of companies) and a low adoption rate (< 50%).

Table 1. Industries with high adoption rate of chatbots in Fortune Top 105 companies

Sector	No	Yes	No. of companies	Percent
Financial	3	19	22	86%
Energy supplier	5	6	11	55%
Retail	1	7	8	88%
Technology	1	7	8	88%
Health insurance	0	7	7	100%
Pharma	0	3	3	100%
E-commerce	0	1	1	100%
Telecom	0	1	1	100%

Source: Authors' own research.

Table 2. Industries with low adoption rate of chatbots in Fortune Top 105 companies

Sector	No	Yes	No. of companies	Percent
Oil and gas	14	2	16	13%
Automotive	6	5	11	45%
Constructions	4	1	6	17%
Production	9	0	9	0%
Commodities trader	1	0	1	0%
Post	1	0	1	0%

Source: Authors' own research.

By analyzing the data, we can conclude that customer-facing industries (financial services, retail, technology, telecom, health insurance, e-commerce) have the highest chatbot adoption rates, as a necessity of the automation in customer support to increase efficiency and reduce operational costs (time-consuming customer care tasks). The industry with the highest early adoption rate of chatbots is health insurance (time-consuming in customer's health data interpretation) and pharma. The financial sector also has a strong rate of adoption as regulations become more complex and the need for employee and customer guidance is high. The technology sector itself has a high adoption rate (88%), reinforcing the idea that AI and automation are crucial in digital transformation. Meanwhile, industries with producing activity (oil and gas, construction, commodities trading) are less likely to implement chatbots due to the lack of direct, large customer base interaction. A limitation of this study is that it can only track public adoption of AI. On the other hand, the research still provides relevant information about successful adoption of chatbots, as those are the cases more likely to be made public.

The research further deep dives into the chatbot use cases for the financial institutions (top adopters), based on the assumption that chatbots are expected to become the everyday companion of personnel at financial institutions like banks, which have plenty of complicated regulations. The advantages of implementing AI were highlighted by Pattanayak's (2022) that investigated the effects of AI on banks' operational efficiency, including fraud mitigation and decision-making speed. While the sector became more regulated after the great recession, internal procedures followed suit, and tools to navigate the intricate regulatory landscape were needed. By gathering the information from content analysis of 2023 annual reports, our research found that chatbots and generative AI tools become the standard solution to improve efficiency in the banking sector.

JP Morgan Chase uses an integrated generative AI tool that assists employees in drafting reports, data analysis, meeting summarizing, task tracking, and guiding employees in the internal procedures. (DigitalDefynd, 2025). Commercial Bank of China employs AI-automated customer support systems to be employed in multiple use cases, such as real-time chatbots handling inquiries, transactions, and account management through NLP. Intelligent call centers use machine learning to optimize call routing, detect customer urgency, and increase the level of fraud prevention with automated transaction monitoring. Additionally, AI systems analyze sentiment while continuous learning refines AI responses, improves efficiency, reduces operational costs and enhances overall customer satisfaction (Industrial and Commercial Bank of China, 2023). China Construction Bank (CCB) developed AI digital services, including, inter alia, a smart banking assistant integrated into its platforms. An important AI service platform is called "CCB Huidongni", which uses artificial intelligence, big data, and biometric technologies to provide financial assistance, customer support, and inclusive banking services for customers. Additionally, CCB incorporated intelligent customer service chatbots within its mobile banking app (China Construction Bank Corporation, 2024). The Agricultural Bank of China implemented chatbots and "ABC E-loan" automate loan processing and financial advisory services; the "ABC Huinong Cloud" digital service platform integrates financial and agricultural data to increase the quality of banking services. Additionally, AI is embedded in mobile banking apps (Agricultural Bank of China, 2024). The Bank of China (BOC) implemented AI smart customer service systems that handle real-time inquiries, transactions, and personalized financial advice through mobile banking, WeChat, and other digital platforms; AI risk control systems for fraud detection; automated credit assessments; and AI algorithms to support automated investment advisory (Bank of China, 2024).

Given their particular focus on financial advising, fraud detection, customer service automation, and operational efficiency, the solutions mentioned above would mainly fit into the

Niche Player quadrant if we were to classify them within the Gartner Quadrant. Instead of being created as widely accessible enterprise AI platforms, these AI solutions are largely intended for internal banking processes. But if generative AI, automation, and scalability continue to grow, some of these solutions might move closer to the Challenger quadrant, exhibiting improved execution capabilities and a broader influence on the financial sector.

As a conclusion, the integration of AI chatbots in the top 5 banks reflects tendencies towards automation, efficiency, and improved interactions with customers. By using generative AI, natural language processing, and machine learning, financial institutions' goal is to optimize operational processes, improve risk management, and improve services offered to customers. These AI-driven implementations not only reduced costs but also strengthened security, personalization, and accessibility, improving the status quo of banking. It was observed that banks typically employed internal models with minimal external influence in order to mitigate operational risk (cybersecurity). Personnel adaptation to the use of such models and limited trust were also real challenges in the technology implementation. A relevant reason for the limited trust was that AI's debut has resulted in job losses, cybersecurity threats, and regulatory issues.

Collection of data chatbots

Businesses leveraged data from third parties to better marketing, improve customer insights, and inform corporate choices. It assisted companies in better understanding their target market, honing ad targeting, and customizing client interactions. security, risk assessment, and decision-making. But third-party data raised privacy concerns since users might not give their consent for data acquisition, and regulatory bodies limited how they can be extracted and used. Inaccurate or out-of-date data often causes accuracy problems and results in bad conclusions, and manipulative advertising, discriminatory targeting, and invasive tracking are ethical issues that can backfire against companies. Therefore, businesses are turning to zero-party, first-party data and synthetic data for transparency, trust, and reducing costs. By automating data collection and capturing insights, chatbots can help companies better understand the requirements, preferences, and customer behavior. With the use of chatbot gathered data, companies can better focus their marketing efforts and customize their products to improve financial results by generating insightful information about target audience and helps companies customize offers, messages, and suggestions

Zero-party data is reliable for targeted marketing since it is information that consumers voluntarily give to businesses. This concept is an evolution of explicit data because customers voluntarily supply it. Companies use membership applications, surveys, polls, and online forms to gather zero-party data; in return, they frequently provide incentives like webinars, e-books, or discounts. Zero-party data contributes to the creation of personalized experiences and improves customer engagement by encouraging a more interactive, trust-based connection between companies and customers. On the other hand, because not all customers provide data, zero-party data has drawbacks such as restricted volume and the possibility of bias or inaccuracy in responses. It relies on consumer willingness and calls for incentives that might not always be effective. Gathering data can be difficult and requires carefully crafted questionnaires and forms. It doesn't provide real-time insights like behavioral data does, and it needs to be treated properly to adhere to privacy laws.

A significant instance of zero-party data gathering comes from Sephora. Customers willingly disclosed their preferences, skin types, beauty issues, and favorite products via surveys and quizzes in return for individualized cosmetic advice and special discounts. This enabled

Sephora to customize promotions and product recommendations according to each customer's distinct beauty profile because consumers typically look especially for items that match their skin tones, skincare issues, and personal preferences (Goss, 2022). Such an approach can be deployed by all consumer-facing brands that want to build a strong loyalty platform by identifying consumer purchase decision reasons and key information they need to gather to deliver tailored recommendations that create added value for the consumer.

In the beauty sector, Sephora is best known as a specialty retail brand that focuses on providing outstanding client experiences using cutting-edge technology and individualized services. Despite not being assessed in Gartner's Magic Quadrant publications, Sephora works with IT companies that are. For example, Sephora's digital commerce capabilities are powered by commerce tools, a leader in the 2024 Gartner Magic Quadrant for Digital Commerce (PR Newswire, 2024). Additionally, Gartner's case studies have emphasized Sephora's use of artificial intelligence (AI) to provide individualized customer experiences. The business uses AI to improve consumer pleasure and engagement by providing virtual try-on experiences and personalized product recommendations. In the end, despite not being situated in Gartner's Magic Quadrant, Sephora's success in the digital commerce space can be largely attributed to its creative use of AI and strategic alliances with top technology companies.

First-party data, or behavioral information, is gathered from customers' interactions with websites, applications, products, and social media accounts in order to enhance customer experience (CX). In order to gather this information, web developers add code to the company's media assets. This allows CX teams to monitor user demographics, IP addresses, login information, browser language, timestamps, and the websites and products that users have visited and added to their shopping cart. After that, businesses keep this data in their CRM systems. After a customer leaves the website, marketers can use this data to retarget them with appropriate product adverts. It can also assist marketing teams in developing consumer segments according to demographics, products, interests, and subjects. Marketers can target users with the appropriate messages by using both first-party and zero-party data to further improve personalization and segmentation. On the other hand, first-party data is limited to the data a company directly collects, which may not provide a full view of customer behavior across other platforms or competitive landscapes. It can also become outdated over time if not regularly updated. Additionally, privacy regulations like GDPR or CCPA impose restrictions on how it can be collected and used. A solid example of the usefulness of first-party data comes from Amazon. Advertisers are able to close the gap between their performance on Amazon Ads and their total marketing efforts by incorporating their own data into AMC – Amazon Marketing Cloud. AMC makes first-party data more valuable by making it possible for advertisers to build custom audiences. This enables companies to focus their marketing efforts on particular consumer segments that are most likely to be interested in their goods or services.

Amazon's cloud computing subsidiary, Amazon Web Services (AWS), has been named a Leader in numerous Gartner Magic Quadrant assessments in a variety of sectors. AWS has been at the forefront of Cloud Infrastructure and Platform Services (CIPS) for more than ten years. For the thirteenth consecutive year, AWS was recognized as the longest-running Leader in the 2023 Magic Quadrant for Strategic Cloud Platform Services (previously CIPS) (AWS, 2024).To better expose the idea, in regards to the Global Industrial IoT Platforms, AWS was named a Leader in the 2024 Magic Quadrant for Global Industrial IoT Platforms, demonstrating its extensive industrial capabilities that help clients improve efficiency, production, and performance. On the data integration tools side, AWS's dedication to offering strong data management solutions was

demonstrated by its positioning as a Leader in the 2024 Magic Quadrant for Data Integration Tools. All these premises highlight AWS's excellent performance and all-encompassing vision across a range of technology areas, confirming its ranking as a Leader in Gartner's assessments.

Nevertheless, even if chatbots could be convenient, there are hazards involved. Of these, privacy issues have been the subject of numerous public discussions (Bolton, et al., 2021). The protection of user information while offering individualized services has become difficult due to chatbots, especially voicebots, exposure to problems like recording user conversations without consent and violating user privacy, which makes consumers perceive chatbots as intrusive. Security risks include the possibility of malicious activities such as speech simulation and eavesdropping because of the open nature of the voice interaction channel and the incapacity of chatbots to directly identify users. Furthermore, users experience discomfort or a lack of control, which makes them feel "creepy" when dealing with voice agents due to their adapting nature. All aforementioned factors act as major obstacles to wider acceptance of chatbots. In terms of privacy control, Amazon has access to personalized data on the consumers' profile for marketing and advertising with limited monitorization. On the other hand, the customer has the freedom of choice in terms of data collection (cookie settings, sharing location, and delivery information) only if they choose the right options for the privacy settings, which sometimes might become difficult due to the user interface that is developed to limit such behavior from users.

Crisis management chatbots

As business and society as a whole navigate an increasingly unpredictable landscape, AI-powered chatbots can become relevant tools for ensuring effective crisis management. These systems can automate responses, provide real-time updates, and handle large volumes of inquiries, allowing companies to maintain communication during disruptions and reduce pressure on support teams. Therefore, the ability of these solutions to adapt quickly to cope with sudden increases in demand might help companies that want to remain competitive and resilient in competitive markets.

In the context of the recent crises, Ukrainian companies and organizations have turned to AI-powered chatbots to maintain effective communication, coordinate humanitarian aid, and ensure public safety. Whether assisting displaced individuals, securing digital spaces, or supporting national defense, these AI-driven solutions played a role in modern crisis response. When positioned within Gartner's Magic Quadrant for Enterprise Conversational AI Platforms, which evaluates solutions based on their ability to execute and completeness of vision, three standout crisis management chatbots illustrate the evolving landscape of AI-powered emergency response.

The #vBezpetsi chatbot, developed by the Emergency Telecommunications Cluster (ETC) under the World Food Programme, fits best within the Challengers quadrant due to its strong execution in delivering real-time humanitarian aid information. By operating on Telegram and Viber, it consolidates crucial details about shelters, resources, and assistance programs, reducing confusion for displaced individuals while easing the workload for aid organizations. While highly effective in crisis communication, its focus remains on structured information dissemination rather than adaptive learning or AI-driven decision-making, making it less aligned with the Leaders quadrant, where more advanced AI capabilities are required.

The UA Anti-Spam Bot, created by Master of Code Global, can be classified in the Visionaries quadrant for its innovative role in maintaining digital security and public trust. As an automated content moderation tool, it scans and filters sensitive or harmful information shared on platforms like Telegram, preventing misinformation and unauthorized disclosures that could pose security risks. Its advanced AI-driven filtering aligns with the growing demand for intelligent

information governance, positioning it as a forward-thinking solution in crisis response. However, its specialization in content moderation limits its broader scalability compared to enterprise-grade chatbot solutions designed for high-volume customer interactions.

The eVorog chatbot, launched by Ukraine's Ministry of Digital Transformation, can be positioned between the Leaders and Visionaries quadrants, as it represents a highly effective, adaptive, and uniquely impactful AI-driven intelligence-gathering tool. Unlike conventional chatbots that focus on customer service, eVorog enables citizens to report enemy activity in real time, making crowdsourced intelligence a key component of national security strategy. Its high execution capability, proven by its success in rapidly transmitting critical data to military forces, establishes its effectiveness in crisis scenarios. However, because it is designed for a specialized security function, its commercial scalability is limited, preventing it from fully fitting into the Leaders quadrant, which prioritizes AI solutions with broad enterprise applications.

These chatbot case studies were selected because they demonstrate how AI-powered conversational systems might play a crucial role in crisis management by delivering aid, safeguarding digital communication, and supporting real-time intelligence gathering. Each chatbot serves a distinct purpose, yet together they highlight the broader potential for mainstream usage in all crisis contexts, including earthquakes, wildfires or military conflicts. By analyzing these real-world applications, this research provides valuable insights into how organizations can refine and scale chatbot technology to enhance crisis response, ensure continuity, and build more adaptive, intelligent AI solutions for the future.

Conclusions

Chatbots proved to be a valuable tool for improving efficiency and engagement, but in both terms of development and adoption, they are still in their early days, and challenges such as privacy concerns, data security risks, and trust issues remain.

Enterprise chatbots have emerged as a tool for improving customer service, but only for improving the performance of unskilled labor and chatbots still struggle with handling complex customer inquiries. Chatbots have been successfully used in helping employees with repetitive tasks and businesses are using AI-powered assistants to boost communications and productivity, but implementation challenges such as resistance to AI adoption, data security concerns, and the need for employee training persists.

Chatbots have the potential to become a valuable tool for collecting and analyzing consumer data, enabling businesses to improve personalization, refine marketing strategies, and enhance customer insights. The shift from third-party data to first-party and zero-party data collection underscores the importance of transparency and user consent, however ethical concerns in data privacy, security risks, and regulatory compliance limit their development.

AI-powered chatbots have shown themselves to be valuable in crisis management, allowing businesses to improve business resilience, automate mass communication, and deliver real-time information. Case studies demonstrate their potential in national security and emergency response, such as their involvement in humanitarian efforts in Ukraine. However, the accuracy, flexibility, and public trust of chatbots determine how useful they are in high-stress scenarios.

Our research underscores the increasing adoption of AI-driven conversational agents, particularly in customer-facing industries, and demonstrates their potential. On the other hand, the research identified the need to improve the reliability of these systems and incorporate sophisticated emotion recognition algorithms, strong data security policies, transparency, and eliminate algorithmic biases through AI training on various kinds of datasets. We identified that the

"AI Bandwagon" is rather overrated and business and consumers alike should look for incremental, slow development that will deliver reliable progress on the long run.

Limitations

There are several restrictions on this study. First, although our study uses case studies and secondary data analysis, primary data collection methods like user surveys or experimental testing could help future researchers better understand consumer satisfaction and engagement levels. Second, because AI technology is developing so quickly, certain conclusions can become obsolete as chatbot skills improve. The long-term effects of chatbot adoption on customer satisfaction and corporate success may be monitored with the aid of longitudinal studies. Finally, to guarantee that chatbot deployment stays equitable, open, and compliant with legal frameworks, ethical issues like bias in AI decision-making and data security threats need constant examination.

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