

THE RISE OF CHATBOTS AND CONVERSATIONAL AI: JOB MARKET DISRUPTION

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Abstract. *The rise of artificial intelligence (AI) is changing how we interact with businesses, governments, and each other, offering convenience and accessibility like never before. As conversational AI continues to evolve, it is estimated that millions of jobs will be impacted. This article provides an overview of the growth of AI, followed by an explanation of how chatbots are changing the job market. The paper also identifies industries leading the way in conversational AI and discusses the impact of such technologies on employment.*

Keywords: *artificial intelligence, ChatGPT, digital transformation, employment*

Introduction

In recent years, automation and artificial intelligence have changed the job market significantly, disrupting traditional employment models and opening up new opportunities for businesses and workers alike. Chatbots and conversational AI are the most disruptive technologies driving this transformation, revolutionizing how businesses interact with their customers and employees. Chatbots are software applications that utilize machine learning and natural language processing techniques to imitate human dialogue [1]. At the same time, conversational AI refers to a more sophisticated chatbot technology that can interpret and respond to complex queries. These technologies are being adopted across various industries, from finance and healthcare to e-commerce and customer service. They are expected to impact employment in the years to come profoundly.

This paper provides an overview of the growth of automation and AI in the job market and explores how chatbots disrupt the job market. We also examine the industries leading the way in adopting conversational AI and discuss the potential implications for employment, including the impact on productivity, workforce skills, and the role of human resources in the digital transformation of the job market. Finally, we provide insights into the challenges and opportunities presented and offer recommendations for businesses and policymakers seeking to navigate this rapidly evolving landscape.

Progress of conversational AI

Automation and artificial intelligence are two related technologies changing how we live and work. Automation is a term used to describe the utilization of technology for tasks traditionally done by humans. It can manifest in various forms, including robots, software, and machine learning algorithms. Conversely, artificial intelligence (AI) pertains to creating computer systems that can undertake activities that usually necessitate human intelligence, like problem-solving, decision-making, and pattern recognition.

Conversational AI and chatbots are specific applications of AI that mimic human conversation. The chatbot is a messaging service developed using a set of rules and artificial intelligence that can be interacted with via a chat interface. The development of virtual assistants is considered one of the most remarkable advancements in the evolution of chatbots. These chatbots use voice recognition and NLP to respond to voice commands and perform tasks, providing a hands-free and convenient way for users to interact with technology. Virtual assistants such as Apple's Siri and Amazon's Alexa have become household names, demonstrating the widespread popularity of chatbots.

In recent years, other examples have emerged, such as OpenAI's ChatGPT – one of the most advanced examples of conversational AI [2]. ChatGPT is a deep learning model based on transformers and has been trained on a vast amount of textual data to produce text responses to diverse prompts similar to those of humans. It has been used in various applications, including customer service, content creation, and language translation, demonstrating the versatility and power of modern chatbots.

Therefore, it is unsurprising that the global chatbot market has experienced a considerable expansion in recent years, particularly in Western countries, as depicted in Fig. 1. In 2021, the worldwide chatbot market was worth USD 525.7 million. It is projected to grow at a compounded annual rate of 25.7% from 2022 to 2030 [3]. Meanwhile, the artificial intelligence category is predicted to have a profitable CAGR of 26.8% over the forecast period [4]. In the future, chatbots are expected to gain significant popularity in the industry thanks to the significant investments made by market participants in this segment.

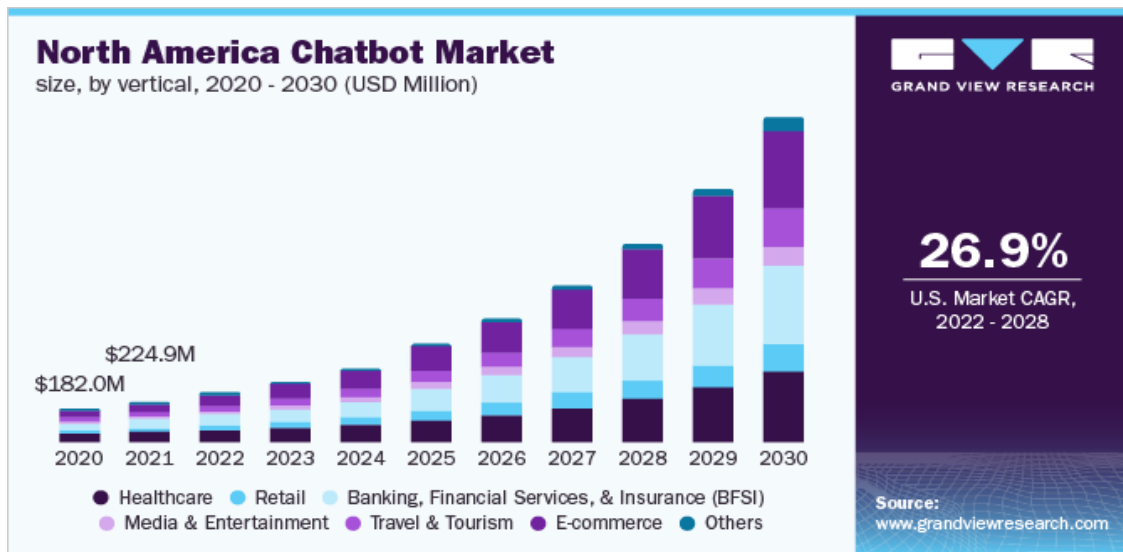


Figure 1. North America Chatbot Market [3]

The growth and development of chatbots and conversational AI technology show no signs of slowing down. The increasing integration of chatbots in various industries and the continuous improvements in their capabilities suggest they are becoming more than just a fad. The possibility that chatbots could revolutionize the way we interact with technology and significantly impact the job market is becoming more plausible with each passing day. As chatbots become increasingly popular among businesses, it will be intriguing to observe how this technology evolves and impacts the future of our world.

Applications of chatbots by the industry

Chatbots and conversational AI are transforming the job market in various ways, including improving the productivity of skilled workers by automating tedious tasks, offering faster and more accurate information delivery, and creating new job opportunities in areas such as software development and data analysis [4]. In addition, chatbots are improving customer engagement by providing personalized recommendations and anticipating customer needs, resulting in increased customer satisfaction and trust. While limitations exist, such as the inability of chatbots to handle complex tasks, their benefits include enhanced efficiency, reduced wait times, and improved customer service [5]. Moreover, tools similar to ChatGPT offer a cost-effective option for businesses and individuals seeking to utilize AI capabilities without incurring additional costs.

As this technology continues to evolve, its impact on the job market is expected to grow and impact more industries, as, as it is shown in Fig. 2. Artificial intelligence systems have been

expanding across various verticals, such as finance, retail, law, automotive and transportation, agriculture, and others [6]. Conversational AI platforms are among the most popular applications in all these verticals. A good example is the Rapid Response Virtual Agent launched by Google in April 2020 to address the issues caused by the COVID-19 pandemic in call centres.

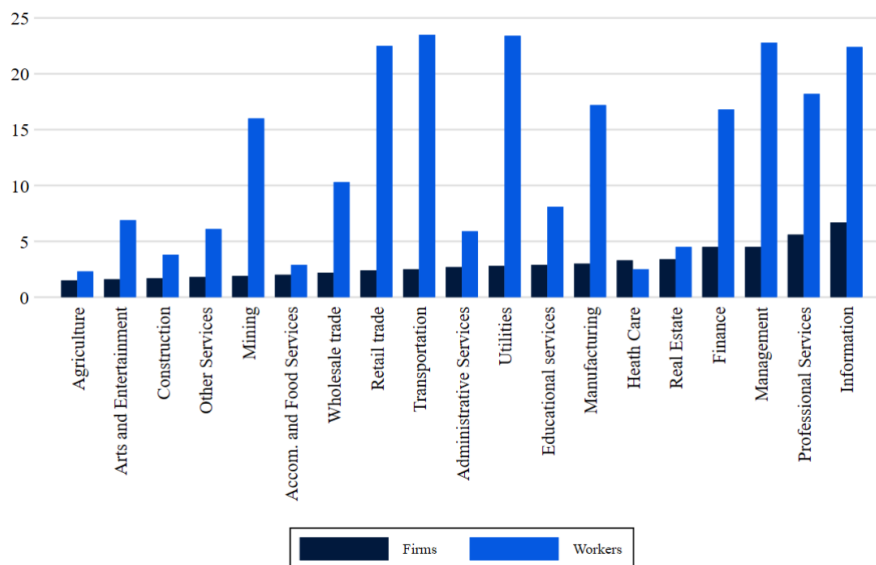


Figure 2. Percentage of firms and workers with some AI Adoption [6]

In financial services, Wings Financial Credit Union uses Nuance Gatekeeper, an AI-enabled biometrics platform, to authenticate members in less than a second with a 99% success rate. This technology considers over a thousand unique physical and behavioural factors for each member, making accounts more secure. Health insurance companies like Humana are also utilizing conversational AI to provide faster support for administrative staff at healthcare providers. Humana's IBM Watson-based voice agent can understand the intent of the call and provide the requested information while verifying the caller's permission to access member data.

Software vendors like Satisfi Labs also build conversational AI examples for their clients. For example, they built a ticket sales assistant that allows customers to search and purchase tickets directly within a chat and a ticket service assistant that handles post-purchase questions. This platform also captures insights into customer buying preferences, helping clients with inventory management and demand prediction.

Professional services firm Marsh McLennan uses Five9's call centre software to launch a multilingual, global HR chat solution that provides 24/7 support. This solution allows messages to be penned in a local language and translated to English, and vice versa, for seamless communication between HR representatives and employees [6]. However, building complex conversational AI requires experience and expertise, as it can be challenging to handle many back-and-forth steps. Chatbots and conversational AI continue to transform industries by improving customer service, providing secure authentication, and capturing insights for business optimization.

The impact of chatbots on employment

The job market has also been profoundly affected by the growth of automation and AI, indicating that it has not remained untouched. It has been projected that by 2025, automation will replace 75 million jobs worldwide and create 133 million new ones, leading to significant changes. While high-skill professions are particularly susceptible to AI, policymakers may utilize AI to enhance work rather than simply automating it.

Digital technologies in the past have been used to automate tasks that involve repetitive actions, such as machine operators and office clerks. However, with the emergence of Artificial Intelligence as a predictive technology, there is potential for automation of non-routine tasks across

a wide range of occupations that humans have traditionally performed. To investigate this issue, a growing body of literature utilizes a task-based approach to examine the impact of AI adoption on different occupations [7]. Rather than assuming that AI can only perform a particular set of tasks, these studies use innovative methods to determine which work tasks can and cannot be automated by AI.

In the future, the rise of AI will bring significant changes to workplace design and business models, ultimately affecting working conditions. Algorithmic management, which uses data collection and surveillance of workers to manage workforces, is becoming increasingly prevalent in various sectors, including retail, manufacturing, marketing, and more. This type of management can strongly reduce workers' agency and further exacerbate wage inequality, occupational safety, and health risks. Weil argues that unfettered AI can become the glue that makes the overall business strategy of outsourcing work even more effective, enabling lead companies and shareholders to better manage their labour supply chains through the intelligent monitoring of outsourced workers.

Mitigating the impact of conversational AI

With the ongoing advancements in AI technology and its increasing presence in the workplace, it is essential for businesses and policymakers to carefully examine the possible consequences for the workforce and implement measures to prevent any potential adverse effects. One solution is implementing reskilling and upskilling programs that enable workers to develop new skills and adapt to changing job requirements. For example, through initiatives such as the Digital Skills and Jobs Coalition, the European Union aims to support individuals and organizations in acquiring the digital skills necessary to adapt to the changing job market [8].

Additionally, governments and organizations can invest in research and development to create new job opportunities that complement chatbots and conversational AI. Fields include machine learning, data analytics, and software development. Moreover, promoting entrepreneurship and innovation could foster the creation of new businesses and industries that utilize these technologies and provide new job opportunities.

To further address the potential negative impact of chatbots and conversational AI on the job market, it is also important to consider ethical and social implications. As chatbots and conversational AI become more sophisticated and autonomous, there is a risk that they may perpetuate biases and discrimination and contribute to job loss and economic inequality. Hence, businesses and policymakers must guarantee that these technologies are developed and implemented with ethical and socially responsible practices.

One approach to promoting ethical and socially responsible use of chatbots and conversational AI is through the development of industry standards and regulations. For instance, the IEEE Global Initiative for Ethical Considerations in AI and Autonomous Systems has developed principles for designing and deploying AI that prioritizes human well-being, transparency, and accountability [9]. By adhering to such standards and regulations, businesses and policymakers can ensure that using chatbots is aligned with ethical and social values and that the potential negative impacts on the job market are minimized.

Conclusions

The rapid adoption of conversational AI presents opportunities and challenges to the workforce. While chatbots can potentially transform the economy positively, they can also disrupt the job market and lead to unintended consequences for workers and consumers. As conversational AI can address non-routine tasks, many workers are likely to be exposed to AI even in high-skill jobs, and job designs may fundamentally change. Additionally, the use of conversational AI by companies may potentially result in violations of current laws related to bias, fraud, or antitrust, leaving them vulnerable to legal or financial repercussions and causing negative economic impacts on workers and consumers. To manage the transition to a more automated workforce, proactive measures are needed to ensure that the benefits of AI are realized while minimizing the negative impacts. Governments

play a crucial role in guiding AI development in a positive direction, ensuring that it creates new job opportunities and does not exacerbate existing inequalities. Understanding the impact of chatbots and conversational AI on the job market is critical, and the need for proactive measures must be balanced.

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