

CDI Briefing Paper June 2023: The AI and Chatbot Revolution

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Introduction

The CDI Ethics and Professional Standards Committee invited Deirdre Hughes to produce a set of guidelines designed to inform and support careers advisers and CDI member organisations in their work and ongoing consideration of the effective use of artificial intelligence (AI) and chatbots in practice.

What are Chatbots?

A chatbot is a computer programme which conducts a conversation via text or audio methods. Another term for chatbots is conversational interfaces. They are basically the same thing. Chatbots are used for different purposes: You might have a mental health chatbot, a customer service bot, a bot that wants to be your friend, or even bots that turn on your lights.

There are two types of chatbots (i) scripted chatbots and (ii) chatbots powered by artificial intelligence (AI). The easiest way to build a chatbot is one that is scripted. What that means is that the bot does not learn from your responses. Its purpose is to respond to specific commands and answer specifically phrased questions. So, from a programming perspective the bot has been programmed with a set of questions which allows the bot to respond to the user, with a corresponding set of answers.

There are also bots that attempt to learn from you. They leverage machine learning capabilities such as AI and natural language processing (NLP). A simple definition for NLP is that it helps computers understand, disseminate, and communicate human language. For example, when Gmail auto-completes sentences in your emails, NLP is being used. Smart devices like Alexa and Siri use NLP to understand what they are being asked. When it comes to chatbots, NLP allows you to have a conversation with a bot that has a memory of your last conversation, so over time it can create a more personalised experience.

At the end of November 2022, the world of large language models (LLMs) changed. The core model in GPT-3 was wrapped up with various behind-the-scenes fine-tuning and prompting to create something that worked intuitively as a fully natural language chatbot, rather than needing the user to provide the necessary prompts and illustrative examples to elicit the desired response. In early 2023, large language machine (LLM) chatbots such as Open AI ChatGPT¹, BING (Microsoft)² and BARD (Google)³ were launched aiming to transform information knowledge sharing on a wide range of topics. They each use natural language processing techniques to generate answers to questions in a conversational manner. In April 2023, Amazon announced it is developing an improved LLM to power Alexa⁴.

Chatbots need ongoing maintenance due to advances in AI and LLMs and changes in data interfaces. Bot enhancements can be identified through regular monitoring of feedback that can be gathered

¹ <https://openai.com/blog/chatgpt> OpenAi's first GPT model, GPT1 came out in 2016, but the impressive results began in 2020 with GPT-3, which had 175 billion parameters.

² <https://www.bing.com/new> In May 2023, Bing and Edge browser reported major upgrades, including the ability to search using visual inputs/outputs and the inclusion of a permanent chat history feature - <https://mashable.com/article/microsoft-bing-ai-chatbot-edge-browser-new-updates-features>

³ <https://www.bbc.co.uk/newsround/65036003>

⁴ <https://seekingalpha.com/article/4597544-amazon-com-inc-amzn-q1-2023-earnings-call-transcript>

within and/or outside of the bot, alongside evidence of usage and data analytics. Chatbots do NOT provide specialist career guidance.

Terminology

Here are some examples of common terminology:

Algorithms

A set of rules, initially created by humans, for computer programs to follow. Artificial intelligence can tweak these algorithms using machine learning, so programs begin to adapt rules for themselves and continuously self-optimize based on what they learn. For example, predictive analytics algorithms become smarter and faster the more they are used and the more data they analyse.

APIs

Application Programming Interfaces (APIs) are becoming openly available to enable greater mash-up of data, including voice-to-text and video combinations.

AutoGPT

AutoGPT⁵ allows users to set an initial prompt (e.g. I want to create a recipe based on _____) and the system then chains together suggestions to autonomously action/achieve the goal that you set.

Bias

Bias commonly refers to being concerned with or interested in one thing more than another or favouring people who look like you and/or share your values. For example, a person may be drawn to someone who has a similar educational background, someone from the same area, or someone who has the same race or ethnicity as them. Human bias is often unconscious, so combatting it requires conscious effort.

In law, bias refers to a predisposition or a preconceived opinion that prevents a person from evaluating the facts that have been presented for judgement impartially. In statistics, bias refers to the systematic favouritism that can be present in processes of data collection. Artificial intelligence (AI), just like humans, is subject to bias. This is not because AI determines something to be true or false for any illogical reasons. It is because latent human bias may exist in machine learning, starting with the creation of an algorithm to the interpretation of data and subsequent interactions.

How Microsoft's Tay chatbot became biased - In 2016, Microsoft launched a Twitter-based chatbot called Tay, which was designed to have the appearance and personality of an 18-24 year old American woman. Tay was an AI chatbot designed to learn from its interactions with Twitter users. The idea was that the more people interacted with Tay, the more it would learn about language, the smarter it would become, and the more realistic and human-like its personality would appear. Lessons can be learned from this experiment.

ChatGPT

The 'chat' naturally refers to the chatbot front-end that OpenAI has built for its GPT language model. The second and third words show that this model was created using 'generative pre-training', which means it's been trained on huge amounts of text data to predict the next word in a given sequence. GPT stands for Generative Pre-Trained Transformer. This means that it learns what to say by capturing information from the internet. It then uses all of this text to "generate" responses to questions or commands that someone might ask.

⁵ <https://autogpt.net/>

Ethics

From a user perspective, a big ethical consideration when it comes to chatbots is transparency. For example, is the user aware of all aspects involving the chatbot and the consequences of interacting with one? A common concern is the privacy and protection of user data. Any detailed personal information the users share with the bot during their conversation could potentially be used and/or sold without consent. It is vital to be open and clear about how data usage, ownership, and protection e.g., alignment with [GDPR](#). The [CDI Code of Ethics](#) covers the professional behaviour and practice required of all CDI members and informs the public of the ethical principles to which all CDI members adhere.

Harms

Harms shown to arise from AI bias:

- **Allocation harms** occur when a system allocates opportunities or resources to certain groups or withholds them. These harms are often economic, relating to things like mortgages, loans, or insurance. For example, if bias caused a mortgage support application to continually deny applications to women or people under the age of 30, this would be allocation harm.
- **Representational harms** occur when systems reinforce discrimination against some groups because of identity markers such as race, class, gender, age, belief, or ability. These harms can take place regardless of whether resources are being allocated. For more information - [The Trouble with Bias - NIPS 2017 Keynote - Kate Crawford YouTube](#) (49 mins.30 secs)

If a user told the chatbot that they were fed up e.g. with being unable to find a job that they were intending to harm themselves, responses will vary depending on the type of chatbot. It might pick up on the user being distressed and provide some warm words of encouragement. Advancements in the coming year(s) will produce new types of highly personalized responses.

All careers chatbots should have a publicly displayed e-safety and social media policy and a privacy policy so that safeguards are in place to protect the chatbot user. A high-quality careers chatbot, should present an option for the user to speak with a human adviser, in the UK ideally this should be a member of the CDI Register of Career Development practitioners.

Large Language Models (LLMs) – LLMs are machine learning models that utilize deep learning algorithms to process and understand language. They are trained with immense amounts of data to learn language patterns so they can perform tasks. Those tasks can range from translating texts to responding in chatbot conversations—basically, anything that requires language analysis of some sort.

Machine Intelligence – describes a computer’s self-learning capabilities using artificial intelligence, machine learning, and deep learning technologies.

Machine Learning – is a type of artificial intelligence that enable systems to learn patterns from data and subsequently improve from experience. It is an interdisciplinary field that includes information theory, control theory, statistics, and computer science. As it gathers and sorts more information, machine learning constantly gets better at identifying types and forms of data with little or no hard coded rules. For example, through pattern recognition, machine learning will increase the accuracy of identifying specific objects or images.

Benefits of adopting a chatbot

1. Seamless Integrations

If an individual's query or problem is complicated and requires live assistance, chatbots can transfer the chat to a human adviser. This seamless integration creates a more seamless joined-up experience because the customer does not have to retell their story. Instead, the adviser can be alerted by the bot with a summary of the previously covered areas of career exploration and pick up the case where the bot left off.

Chatbots can also be integrated with a CRM system to personalise the client/customer interactions. It can research each customer's past experience connecting with your brand and reference relevant information when necessary. Unlike humans, bots can look up this data immediately and know exactly where to find the information they are looking for.

2. Task Automation

If an adviser is not available for transfer, chatbots can also perform follow-up functions. They can schedule meetings with customers and assign advisers with individuals who need guidance support. Some bots can even send follow-up emails to customers. Task automation like this creates a more consistent customer experience and helps the team keep track of unfulfilled customer needs.

3. Applied use of technological advancements to good effect

The career development sector has under-developed the use of AI and NLP chatbots. By using this method, careers specialist organisations and professionals can show they are innovators as well as expert deliverers of careers education, information, advice, and guidance (CEIAG). One of the advantages of chatbots is that, unlike humans, bots can respond to customer inquiries around the clock. With 24/7 chat capabilities, the bot can answer customer questions instantly, without requiring them to call a service team between working hours. There's no ceiling to how many people a chatbot can handle, which allows service delivery teams to focus on the more complex requests to good effect, specifically in-depth career guidance inquiries that may come their way.

4. Reduced Case Volume

Chatbots can potentially reduce case volume for advisers. This frees up expert advisers to focus on more complex and time-consuming cases. Since bots are a self-service tool, clients/customers who have straightforward information questions do not have to speak with an adviser to get straightforward answers. They can access information and advice 24:7 on a mobile phone, ipad, personal computer or other device. Whilst chatbots claim to offer advice, there are limitations to this e.g. chatbots vary and some offer advice without any personalised or contextual information.

Do chatbots give advice and/or only provide information?

Chatbots using AI are becoming increasingly sophisticated and tend to offer both information and some basic advice. The latter tends to be simplified generic pointers without any contextual awareness built-in. For example, if you type into ChatGPT "Can you advise me on where to start looking for jobs?" The chatbot will respond immediately with "Sure, I can help you with that. Here's a few suggestions for where you can start looking for jobs..." The bot will also respond positively when you ask "Can you coach me for a job application?" – it will produce "Here's a list of pointers to make your application stand out..."

Health Warning

Careers professionals should be aware that chatbots using large language models (in their current form)

- Do not ask for context – without context it is hard to offer good advice. The generic statements are there but a more robust and reliable answer requires context and ask if user willing to answer questions.
- Provide no challenge or probing questions.
- If the user asks for specific opportunities, it is likely to either refuse to answer or make up inaccurate responses. You would need the LLM plugged into local labour market information/intelligence (LMI) and trained to probe for context in these kinds of contexts.

The pace of AI advancement is rapid. Academics and technology experts agree that human intervention i.e. keeping the human in loop will still be needed for those individuals who require support beyond information and basic advice.

There are global concerns about the potential danger of AI, saying it can easily spread misinformation and is reaching a level of intelligence at which it can compete with humans ([Elon Musk et al, March 2023](#)) Tech leadership calls for greater regulation of AI technology. The European Commission is proposing the [first-ever legal framework on AI](#), which addresses the risks of AI.

The differing forms of AI chatbots have differing strengths and weaknesses. In a career guidance context, some chatbots (and there aren't many) have a built-in speak-to-a-human adviser function, enabling the user to choose this option, if required. Care is needed to ensure the adviser is suitably trained and qualified and adheres to a code of professional ethical conduct e.g. [CDI Code of Ethics](#)

Conclusion

Some see AI as one of the most fundamental transformative technologies in the history of mankind, and for others, this is a transformative power and something we should be scared of and be wary about. If AI is transformative, then it has the power to be transformative both for good and bad reasons. Concerns about the use of AI seem to stem from: general anxiety about machine intelligence, the threat to jobs, concerns about super-intelligence, putting the power of AI into the wrong people's hands, and the unknowns when it comes to new technology.

The careers profession has an opportunity to develop and support effective, ethical solutions within AI and chatbot innovative technology to ensure 'staying ahead of the innovation curve' now and in the future.

Selected examples of different types of chatbots

1. [Find out more about Woebot](#) (you will have to download the Woebot app)
2. [Find out more about Walk with Yeshi](#)
3. [Find out more about Roo](#)
4. [Find out more about DoNotPay](#)
5. [Find out more about CiCi – the careers chatbot](#)
6. [Find out about the National Careers Service chatbot](#)

7. [Find out about ChatGPT](#)
8. [Find out about BING](#)
9. [Find out about BARD](#)

Useful reading

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Forbes (2021). *Building a Bot to Beat the Bots: An Award-Winning Approach from Across the Pond* - <https://careerchat.uk/interview-on-forbes-website/>

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