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What is Generative AI?

AI is a common topic of discussion for our innovation team; with clients, colleagues and peers alike asking the areas, benefits and pitfalls of the tool. So we caught up with [Alex](#) and [Andrew](#) to find out more about just what Generative AI is, how it can support your business, and where it might hinder it.

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[Alex Waterston](#)

Associate Director - Innovation & Leadership

Email

alex.waterston@waterstons.com

LinkedIn

<https://www.linkedin.com/in/alex-waterston-0a56551b5/>

Generative AI is a tool that can generate huge amounts of text and images based on a prompt you give it. If you ask it a question, it will try to give a sensible answer; if you ask it to draw a picture, it will try its best to create something.

Like all AI tools, it is fed enormous quantities of data in a process called training the goal of which is for it to learn to use data to complete a task. In the case of generative AI, the goal is to be able to make new things based on the data it has already seen.

What would that look like?

If you ask, 'can you give me an oil painting of the Statue of Liberty holding a banana?' it would attempt to create something that fits the prompt

and since it has already 'seen' thousands of pictures of New York and fruit during training, it will try to replicate the styles of those images. The magic is that it will most likely create something that does actually look like the Statue of Liberty holding a banana.



[the Statue of Liberty holding a banana]

Aside from images, a form of generative AI known as a large language model (LLM) can be used to generate text. If you ask, 'Can you tell me about the IT consultancy Waterstons?'

It will respond, 'Certainly! Waterstons is a UK-based business and IT consultancy firm that specializes in helping organizations with their technology and digital transformation needs. They offer a range of services and solutions to help businesses leverage technology effectively to achieve their goals.'

This is of course correct! ChatGPT has seen almost all the text on the internet and will use it to create an answer to your question. When creating a response, it will 'ask' itself 'what is the most likely word to come next?' and give you that word and keep asking itself until it's satisfied that the prompt has been answered. At a very simple level that is what these models are - a very powerful predictive text machine. As we

mentioned earlier, AIs are trained on data and it's this dependency on data that makes them so powerful and good at predicting the next word - but it's what also makes them a potentially huge liability.

What can I do with it?

The ability to generate text and images from a computer sounds like magic, but what can you practically achieve with it? How can this help your business? A machine that can randomly create data isn't actually that useful unless you make it specific to you – assuming you don't need images of famous landmarks holding fruit.

Recently, data has been used to automate things associated with numbers - replacing Excel spreadsheets, building reports, and crunching numbers - but now we can think about automating tasks involving words and pictures.

We have spoken to clients and partners about a range of projects they are interested in doing where real value could be gained, and real efficiencies to eke out, through the use of generative AI:

- **Drafting documentation:** It is very good at generating large amounts of text, quickly. By training on internal documentation, it can be used to generate drafts of proposals and reports for a human to then finish. We have seen this use case, and the following one, come up repeatedly, whether it's internally or externally with law firms, M&A companies, and fashion brands.
- **Handling text:** There is a lot of manual processes related to managing documents – summarising long Word files, taking parts from multiple files and merging them together, and understanding where files differ among many, many other activities. These menial tasks that involve natural language are a prime space for implementing a large language model to help automate.
- **Knowledge bases:** You have gathered a huge amount of information about your company! Processes, previous projects, documentation, and an uncountable amount of other stuff. AI models can be trained on this to give a more user-friendly way of accessing this ocean of data. Instead of trawling through SharePoint, you could just ask an AI a question. Could you even make it public facing to act as a customer service bot on a service desk? Tools that service desks use are already investigating this as a possibility, and clients of ours are internally testing their own in-house solutions for this.
- **Making more of what you have** A popular use case we see is to use image-generating tools to make new versions of the products you already make. Architects are using it to generate new ideas for buildings; production companies want to use it to generate new 3D models of sets; and shoe designers can use it to make new designs of sneakers. This takes only seconds and can be used as inspiration, or for a human designer to take away and refine.
- **Advertising:** AI models have seen every viral tweet and ad campaign, and each one that never went viral. Combined with your catalogue of product images, can you use it to write viral content for you?

What unifies all these is the catalogue of data you already have for your company. Mostly, these do not use generic off-the-shelf models but rather something bespoke to you; the goal is not to replace human creativity, but to augment it. Ideally, it's a tool to make people more efficient and automate away boring parts of their job, freeing them up to be creative and original – something a human is amazing at, but AI cannot replicate.

Regardless of what you read, Generative AI won't automate everything, and it can't do everything. More it will bring you the most value once you identify niches it can fill and, once you train it on your own data, to specialise it to your business.

It's a technology that has a long list of challenges to overcome. There is a different set of constraints when applying generative AI to a process, compared to undertaking a 'standard' software development project that you need to watch out for. Data security, the truth, biases, and more, are things that need to be deeply considered.

What do I need to be thinking about?

The board has signed a project off, and your data scientists are ready to go, but how are you going to overcome all the challenges that using AI brings? If this tool you make becomes publicly facing, it will represent your company; if it's for internal processes it will interfere with decision-making - an AI model will never be 100% accurate, so are you happy to accept the errors?

Here are some of the issues we see regularly:

- **Data security and privacy:** The AI models you use are typically run and trained by a company like OpenAI or Microsoft. When you send them your data, do you know what will happen to it? The default behaviour for a lot of these models is that your data will become part of the dataset used to train a future model. This means when you query the public version of ChatGPT in the future, your data might already be inside it, effectively making your data and IP publicly available.

- **Bias and discrimination:** AI models gain their 'knowledge' from the data they are trained on. In fact, they can only know things that are based on this data, and because of this will echo what is in it. If your training set contains sexism, racism, homophobia, or other forms of discrimination, your model can output these behaviours too. Remember, a lot of these models have been trained on the internet, even some of the gruesome bits.
- **Creativity and originality:** If these models have been trained on the internet, and can only understand what it is trained on, it follows that it cannot have an original thought. We don't believe that any AI model out there can match human creativity and originality. AI models are parrots – only able to show you something it has seen before.
- **What is the truth?** Generative AI models are trained to predict the next word to type or create an image that might look like the prompt you've given it. It has no understanding of the truth. If you play with any of these tools it won't be long until it's generated a human with 6 fingers or told you a 'fact' that is demonstrably untrue.
- **What does it know?** If a model only knows what it has been trained on, what does it know about you? A generic version of ChatGPT will not know anything about the internal workings of your organisation. So, how useful is it? Maybe not very. These models can be retrained, or 'fine-tuned' to be more specific – to understand your business, your processes, and your documents.

Why are we excited about it?

Even though there are lots of worrying things to consider when using generative AI, we are still very excited about it. We are realistic and pragmatic, but also believe that these tools can be used to build something that can change your business.

We see across every sector we work in that people are keen to increase their data maturity. They are excited to go on a journey to use data smarter, become data-driven, and automate decisions based on the patterns they have seen in the past. People are gathering more and more data as part of this, and getting better at storing, processing, and visualising it. The result of this is that many people are ready (or at least want to be ready) to experiment with using generative AI models based on their business's own data.

As we mentioned last week, there are lots of boring everyday processes that it can help replace; drafting documents, summarising, and more, can be made more efficient. Generative AI allows a whole new category of processes to be looked at to see if they can be automated. Typically, automation pipelines focus on numbers – does this still have to be the case?

In the last year, AI tools have gotten cheaper and easier to use. Models which used to only be accessible in research labs are now available to the public. The technology is being democratised, with powerful generative AI models available open source. This means you can host them yourself and train them with your own data, all without worrying that you will leak your data to the public.

What Next?

We would love to talk to you about how to use AI safely and securely. If you want to talk more about AI and how it could impact your business get in touch with the Waterstons Innovation team!

Andrew.blance@waterstons.com / alex.waterston@waterstons.com

Learn more about what we do, and the adventures we go on, on our Substack <https://waterstonsinnovation.substack.com/>

Glossary (aka: How does this compare to all the other buzzwords I hear?)

circles inside circles

all the buzzwords are linked!

Data Scientists have created a lot of complex-sounding words to explain what AI does. Let's try to simplify it. Artificial Intelligence (AI) is a term that's quite woolly and tough to define, but in general, it refers to the attempt to make a computer process information similar to how we humans do.

Machine Learning (ML) is a term that's related to this, but more focused on how you apply this idea to actually solve problems. This works in a way that is quite different to how we expect computers to operate – normal computer programs require a human to write out the precise rules for how a program works. Instead, machine learning uses huge amounts of data to try to figure out the rules itself. Maybe you feed it lots of images of cats and dogs, and over time it learns to tell them apart.

There are a lot of machine learning methods you can choose to do this, each of these is called a model. A particularly popular model is a neural network, which if you draw on a piece of paper will kinda look like your brain. These dense and interlinked networks can become incredibly powerful, and if we make them big enough, form a whole subfield of AI called Deep Learning.

In 2023, AI has become shorthand for something like ChatGPT (which itself is actually a deep learning model). ChatGPT, and the other GPTs out there, are a form of Generative AI. Specifically, a Large Language Model – a generative AI model designed to handle text.

There you have it, now you know everything you need to know about Generative AI!

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