Will generative AI transform business?
What is generative AI?
Generative AI is a set of algorithms based on foundation models, a term that the Stanford Institute for Human-Centred Artificial Intelligence says "underlines their critically central yet incomplete character". Such models are "trained on broad data (generally using self-supervision at scale) that can be adapted to a wide range of downstream tasks". The data behind generative AI programs such as ChatGPT and Google Bard are sourced from across the internet. It is a huge set of training information. One example is Dall·E 2, the text to image generator from OpenAI, which was trained on 650mn images.

A White House white paper gives this summary: "The power of AI comes from its use of machine learning, a branch of computational statistics that focuses on designing algorithms that can automatically and iteratively build analytical models from new data without explicitly programming the solution. It is a tool of prediction in the statistical sense, taking information you have and using it to fill in information you do not have."

What can it do?
Based on the training data, generative AI can "create" content by autocompletion based on predictive sequencing or probability. In the same way that it uses likely word sequences to build sentences, generative AI employs pattern recognition and reproduction to create images, video and audio. In the case of image generation, given a text description it predicts the most relevant image. It can also summarise and answer questions about data, including text.

How can it be adapted?
By augmenting the training data with narrower or specialised inputs, generative AI can be fine-tuned for specific tasks. It can create marketing content in a given style or be adapted to suit an individual recipient. It can collate swaths of information and distil these into recommendations based on a specific input, for instance travel itineraries or consumer products. It can analyse data and come up with novel conclusions.

What can it not do?
AI cannot reason — and due to its "autocomplete" nature, users can never be sure of its factuality. It is a statistical beast and not a database. Ward says: "[The models] are just piecing words together and then using statistics to pick the next words off of that string — but it really depends on what you ask it, how you phrase it and that changes the outcome." Ask how British company Dyson is dealing with the space vacuum — or even what time a particular shop opens — and there is a high chance that, in its current state, you will receive a confident but nonsense answer unsupported by facts.
Generative AI is developing rapidly both in terms of usage and sophistication. Since the public release in November 2022 of ChatGPT, OpenAI’s large language-based chatbot, the number of people who have experimented with generative AI has grown rapidly. In its first five days the platform had more than 10 million users. Insider Intelligence, the research and insights provider, forecasts that by the end of 2023, 25 per cent of internet users in the US, nearly 80 million people, will deploy generative AI. The AI phenomenon is not limited to America. A Salesforce survey of 6,000 people in the US, UK, Australia and India found that half of them had used generative AI. India was the leader with nearly three-quarters of respondents having tried the technology. Since the public release, the functionality of generative AI models has improved. Their understanding, reproduction of natural language and accuracy are all better. Christian Ward, the chief data officer of Yext, the digital experience platform, says the fact that generative AI can understand human language has helped. He says that when internet search evolved, users learnt to “speak keywords...bending their behaviour to computers”. With generative AI, people no longer have to be tech-savvy despite its advanced technology. AI is “human-savvy” and allows us to communicate with it naturally, making it more accessible.

“It used to be that computer-savvy humans had an advantage,” Ward says. “Now that computers are human-savvy, that advantage is being democratised. That is absolutely one of the biggest breakthroughs we have seen in technology in a very long time.” He adds that once search functions reach the point where we use them by speaking to them as if they are human, “that construct (opens up) in a way we’ve not experienced before”.

**Will generative AI transform business?**

Industries expect demand for quality control and human oversight of AI-generated content to grow, writes Lucy Colback

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### AIf’s potential impact on the global economy

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<thead>
<tr>
<th>$tn</th>
<th>11.0-17.7</th>
<th>2.6-4.4</th>
<th>13.6-22.3</th>
<th>6.1-7.9</th>
<th>17.1-25.6</th>
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<tr>
<td><strong>Incremental economic impact</strong></td>
<td>-35-45%</td>
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<td>-35-70%</td>
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### Advanced analytics, traditional machine learning and deep learning

| Source: McKinsey |

### New generative AI use cases

- **All worker productivity enabled by generative AI, including in use cases**
- **Total AI economic potential**

### Who is in the field?

In its analysis of the generative AI market, Acumen Research and Consulting lists D-ID, Genie AI and Rephrase.ai among the leading players, together with more recognizable names such as Amazon Web Services, Adobe, Google, IBM and Microsoft. Besides these heavyweights, applications have mushroomed to serve specific industries such as recruitment, that can be cost-effective. The consultancy highlights a 2022 experiment in which Snorkel AI spent less than $8,000 to fine-tune a large language model. The consultancy says that “to be an industry leader in five years, you need a clear and compelling generative AI strategy today.”

### Commercial potential

Michael Wooldridge, a professor of computer science at Oxford university, calls 2023 a “watershed year” for generative AI. He says that the technology, which has been transformative as the microprocessor, which made possible the personal computer, the web and smartphones. Despite that, there has been a move towards integrating generative AI into the business environment, and in doing so, it has led to environmental improvements. The potential of generative AI on the global economy vary from the 7 per cent of gross domestic product (GDP) of the US, to 15 per cent of GDP in China. This is a significant increase from the 7 per cent of GDP in China, to 15 per cent of GDP in the US, China, India and the European Union.

### Get with the strategy

Even though it is early days for generative AI, BCG, the consulting group, believes that “to be an industry leader in five years, you need a clear and compelling generative AI strategy today.” The report states that “generative AI has a number of compelling attributes that could lead to a significant impact on the global economy.”

### Modify or build?

There is no straightforward answer to the question “modify or build?” Tweaking the general model to create a niche application is at least not too costly. According to BCG, fine-tuning (providing a curated data set on top of the original training data) can be cost-effective. The consultancy highlights a 2022 experiment in which Snorkel AI spent less than $8,000 to fine-tune a large language model. The consultancy says that “to be an industry leader in five years, you need a clear and compelling generative AI strategy today.”

### Conclusion

The adoption of generative AI is expected to transform industries, with a significant impact on the global economy. The potential of generative AI to supercharge communications and marketing is substantial, with improvements in efficiency and accuracy. Companies should focus on the specific use cases that align with their business objectives, and consider the integration of generative AI into their existing infrastructure. The use of generative AI in industries such as marketing, healthcare, and finance can lead to significant gains in productivity and efficiency. Companies should invest in the necessary practices to ensure the responsible and ethical development and deployment of generative AI technologies.
### Use cases

#### Consumer facing

- **Marketing content and strategies**
  - Amplifying or creating marketing content and strategies can work well where experimentation (or even AI hallucinations) is a creative bonus and where accuracy is not critical. Through fine-tuning based on a company’s content, marketing materials can be generated at scale in a tone that maintains brand and message consistency. These can also be easily translated into numerous languages. Such communications can be personalised by using customer data. Content can be text, image or video based.

- **Strategies can be tested and tweaked for optimisation based on engagement and conversion data.**

#### Customer service and support

AI can provide chatbot responses to customer queries in natural language. Human interaction can come later for more complex queries. AI can also help with retrieval of client data and internal enterprise knowledge, both to anticipate queries and customise responses.

- **Film and video**
  - Sarah Guo, the founder of Conviction, believes that videos content is a noteworthy growth opportunity. “High quality video at lower cost means there will be more of it,” she says. “Any story you want to publish you could have it described by an avatar and in any language.”

- **The cheapness and ease with which videos can be created from text prompts will facilitate the creation of short films for anything from advertising to internal information dissemination.** On the big screen, Gartner predicts that by 2030 we will see a blockbuster film that is 90 per cent created by AI.

- **Search functions**
  - Sources: Acumen Research and Consulting

  ![Image](image.png)

  **Generative AI market $bn**

<table>
<thead>
<tr>
<th>Year</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
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</thead>
<tbody>
<tr>
<td>Usage</td>
<td>0</td>
<td>50</td>
<td>100</td>
<td>150</td>
<td>200</td>
</tr>
</tbody>
</table>

- **Teaching**
  - AI is excellent at explaining things. It will produce different iterations to find an answer that resonates most with a learner. It can then create personalised lesson plans to match the learner’s style as well as help with broader course design. Duolingo, the language learning app, uses AI to create responsive dialogues and explainers that enhance the learning experience.

- **Given enough prompts, generative AI can design new products or personalise existing ones based on customer data.** For example, Under Armour and Nike, the trainer/sneaker makers, have both experimented with AI for design. In time, generative AI may inspire or come up with novel products, processes or services ideas.

#### Film and video

- **At the moment”, which is “an awful lot of what programmers do”.** He adds, however, that it is far from “superhuman” and that its limitations are a difficult thing”. He says: “One of the cool things about this technology is it will brainstorm for you. You can feed it some rough drafts of ideas and then keep pressing a button. ‘Give me another idea’ and it may give you ten ideas, but you have one that grabs your attention.” Particularly in science, where marrying ideas and techniques across disciplines can take a leap of imagination, generative AI is likely to offer new insights.

#### Internal

- **Hype about generative AI generally outruns implementation.** Plenty of company managements talk about it but few offer evidence of having used it. Ultimately businesses may gain more value from experimenting with AI internally than in a consumer-facing area. For the early mover the goal is not simply efficiency gains or cost-cutting. A McKinsey survey found that organisations that employ generative AI were more likely to be using it to create new businesses and increase revenue streams.

- **Brainstorming**
  - Generative AI can create numerous suggestions based on limited input. Wooldridge says that in-person brainstorming “is a terribly difficult thing”. He says: “One of the cool things about this technology is it will brainstorm for you. You can feed it some rough drafts of ideas and then keep pressing a button. ‘Give me another idea’ and it may give you ten ideas, but you have one that grabs your attention.” Particularly in science, where marrying ideas and techniques across disciplines can take a leap of imagination, generative AI is likely to offer new insights.

#### Teaching

- **A variety of AI programs can already put together slides based on a basic text brief and information gleaned from the internet, or using customer data.** Content can be text, image or video based.

- **Large quantities of textual or numerical data can be collected, collated and summarised using AI, which will also translate the results at speed. Notable applications range from summarising manuals to locating corporate knowledge and creating knowledge repositories.**

- **AI can write a first draft of a code based on natural language prompts (“I’d like software that does this”) or edit and help to find bugs in current software.**

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- **Presentación creación**
  - A variety of AI programs can already put together slides based on a basic text brief and information gleaned from the internet, or from uploads of more complex documents or data.

#### Data analysis

- **Given any set of data, generative AI can create charts and find trends that a human analyst might not think to look for.**

#### Medical innovations

- **Medical innovations**
  - Important breakthroughs in medicine are likely to be accelerated by AI. Already the technology can identify candidate molecules for therapeutic use, a technique especially suited to proteins. There is also the potential for it to consider symptoms and find a connection with an illness that has been missed by a human. AI can identify the best candidates for drug trials and accurately match treatments to patients. The first AI-designed drugs are on their way.

#### Internal knowledge banks

- **Internal knowledge banks**
  - Large quantities of textual or numerical data can be collected, collated and summarised using AI, which will also translate the results at speed. Notable applications range from summarising manuals to locating corporate knowledge and creating knowledge repositories. AI can also run and test programs to ensure that they achieve the intended outcome or to optimise code.

- **It is important to have realistic expectations.** Wooldridge says: “My experience is that it’s very good writing short, routine programs at the moment”, which is “an awful lot of what programmers do”. He adds, however, that it is far from “superhuman” and that its limitations are a difficult thing”. He says: “One of the cool things about this technology is it will brainstorm for you. You can feed it some rough drafts of ideas and then keep pressing a button. ‘Give me another idea’ and it may give you ten ideas, but you have one that grabs your attention.” Particularly in science, where marrying ideas and techniques across disciplines can take a leap of imagination, generative AI is likely to offer new insights.

#### Product design

- **Writing software**
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#### Search functions

- **Search functions**
  - Searches that use AI can provide comprehensive answers on anything from product comparisons, which increasingly come with references to aid fact checking, to suggestions for travel itineraries and recipes.

## ChatGPT is the fastest application to surpass 100mn users

<table>
<thead>
<tr>
<th>Source: Goldman Sachs GIR</th>
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<tbody>
<tr>
<td>Months taken to surpass 100mn users</td>
</tr>
<tr>
<td>ChatGPT</td>
</tr>
<tr>
<td>Pinterest</td>
</tr>
<tr>
<td>Uber</td>
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</tbody>
</table>
**Sector specific**

Academic and research papers

Students’ use of ChatGPT to write university essays has been well documented. The intention is not necessarily malicious. Wooldridge has sympathy with those who simply wish to improve their writing. “We’d all love to read better-written scientific papers [given that] the average standard of scientific paper is dull beyond imagining,” he says.

Papers so drafted, however, come with a health warning given the propensity for generative AI to make things up. “We know that this technology hallucinates and gets things wrong and it introduces that possibility. I’d rather have a paper where I was confident that it was listening to what the author said,” Wooldridge added.

Legal profession

AI can speedily analyse and condense screeds of documents from contracts to case law. As such it is likely to be of great value in the legal profession and it is already deployed by numerous firms. It can help with drafting, standardising and rationalising contracts, performing due diligence, drafting and compliance.

In March PwC UK, the professional services group, entered a deal to develop generative AI with OpenAI’s Harvey. In a similar vein non-law firms can use generative AI to create requests for proposals and analyse which contracts and services generate the most revenue. Note though that using AI to create a legal case without checking is generally regarded as a bad idea.

**Finance**

Generative AI is already being deployed for financial analysis. Guo mentions a company that has built an app to understand the earnings reports, interviews and stock exchange filings of competitors. By using generative AI “they can grasp a lot of information quickly,” he says.

Wooldridge has sympathy with those who simply wish to improve their writing. “We’d all love to read better-written scientific papers,” he says.

**Impact of generative AI on technical automation potential in midpoint scenarios**

Overall technical automation potential, comparison in midpoint scenarios (% in 2023)

<table>
<thead>
<tr>
<th>Sector</th>
<th>With generative AI</th>
<th>Without generative AI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educator and workforce training</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Business and legal professionals</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Stem professionals</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Community services</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Creatives and arts management</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Office support</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Managers</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Health professionals</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Customer service and sales</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Property maintenance</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Health aides, technicians and wellness</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Production work</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Food services</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Transportation services</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Mechanical installation and repair</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Agriculture</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Builders</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
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</table>

* Previous assessment of work automation before the rise of generative AI. ** Includes data from 47 countries, representing about 85% of employment across the world. Source: McKinsey

**Prone to errors**

While generative AI programs have advanced rapidly and results from ChatGPT have already surpassed those from the initial release, the content that large language models are designed to produce is what is statistically probable rather than factually correct.

Wooldridge says that while it is a good tool, companies would be “criminal negligence” to let loose AI-generated software code without checking it. “That would be an extraordinarily dangerous thing to do, not because I think it would destroy the world but it might trash your employer’s hard drives,” he says.

Reputational risk is also high. McKinsey’s survey finds that the proportion of companies that are aware of this is far higher than that trying to mitigate it.

**Public perception**

 Ipsos data show that consumer distrust is high and rising but this may improve as use of the technology becomes more common. PwC’s March report suggests that the experience of using AI in a business context is greater and anxiety is lower.

Research from KPMG shows that the young, the university educated and managers generally hold more positive attitudes towards AI, as do those in emerging economies such as Brazil, India, China and South Africa, where the benefits are perceived to outweigh the risks.

**Skills obsolescence**

One side-effect of generative AI’s ease of use is that the skills required to develop technology more generally are likely to change. For instance the demand for quality control and human oversight of AI-generated content will grow, while that for humans who can originate content is likely to fall.

The landscape is changing so quickly that even prompt engineers — the programmers who optimise questions to get the best response from foundation models — could soon be obsolete. In addition workers who currently help non-technical people understand computers will be redundant.

Generative AI can of course help to devise retraining courses. Critical thinking will be an increasingly valuable tool.

**IP and copyright concerns**

The issue of intellectual property will be increasingly important for “created content”, especially with generative AI being able to write or draw “in the style of”.

Authors are ever more vocal about copyright infringement over the use of their works in the training data set. They also fear that the use of the technology will have “stolen intellectual property” without attribution.

Microsoft has sufficient confidence in its guardrails against any infringement that it has pledged to provide legal protection for users sued for copyright breach.

**Misuse**

As well as the drawbacks above, generative AI has the potential for misuse. Wrongdoers can use it for anything from disinformation at the state level, including creating and spreading deepfakes, to honing phishing scams at an individual level. Actions that used to be limited by money or time are now achievable with generative AI. A UK parliamentary committee on large language models noted that the cost of election tampering had fallen from £1m in 2015 to a few thousand dollars.

Cyber and data security is increasingly problematic and Ward cautions that “there can be a lot of issues with letting this thing run around on your data”. Problems range from potential leakage of proprietary information to faking up of privacy laws.

Regulation may be one way to counter some of these aspects. Wooldridge says that even if governments establish some sort of authenticating body to ratify models, any tests they use must be credible, new each time... and something the machine will never read on the internet. Allowing Big Tech to self regulate is not a safe solution.

**What next?**

With such a new and fast developing technology it is almost impossible to anticipate what comes next. The generation that grows up with generative AI may devise entirely new uses for it, similar to the way in which the digital native generation has reimagined how and what can be sold via digital media such as social media and YouTube.

One thing is certain though: business managements will need to keep up with developments to know when and how they may be able to use generative AI.

**Glossary**

• **Large language model/LLM**: a deep learning algorithm capable of taking in vast amounts of content and producing humanlike writing or realistic imagery.

• **Deepfake**: Realistic fabricated media, often video, which purports to show a prominent person saying or doing something they have never said or done. One of the most well known is a deepfake of President Barack Obama from BuzzFeed Video.

• **Guardrail**: A programming feature that allows or instructs generative AI not to follow certain commands or perform certain tasks, for example copying someone’s work or their creative style, or generating hate speech.
The hype surrounding generative AI is at a peak. Businesses that look beyond this point see it as a revolutionary technology that has the potential to create great value but they also recognise that, if not managed well, it can cause harm.

That said, companies that embed the technology intelligently into their organisational processes, that have the courage to reinvent their markets and the grit to stay the course, will emerge stronger, more productive and unbeatable in their fields.

**Generative AI adoption**

In the business-to-consumer realm, the level of adoption of generative AI is already impressive. The fact that AI can communicate with users in their native languages makes it vastly accessible. It is no exaggeration to say that this technology has the power to democratise the world. Consumer-facing services have already experienced the effect of generative AI in areas including education and the creation of music and content.

A good way to think about the rate of adoption of generative AI is to consider the time taken for the internet to permeate society. Even after 25 years, e-commerce penetration is only at 30 per cent to 40 per cent. The adoption of generative AI is likely to be much faster: in some digital services markets such as music, it could explode. Deep and wide penetration will take time, however. We are at an early stage and many lessons will be learnt.

In business-to-business settings, the potential benefits of generative AI are significant but challenges have to be addressed before the technology is deployed at scale. Additionally, there are social, commercial, legal and ethical questions that will need careful consideration.

Regulation to make businesses accountable for the use of generative AI will be put in place more quickly than has been the case for other technologies. Most companies will need to adopt practices that are already the norm in financial services and the pharmaceutical sector. In relation to their use of generative AI, businesses should adopt the mantra of “do no harm”.

We can see significant interest in generative AI from all our enterprise customers. I have been surprised by the range of use already in place. Adoption is well advanced in sectors including software engineering, content generation, advertising and research and development. This is especially the case in healthcare where generative AI has transformed the understanding of chemistry and biology. It is evident that realising the potential of AI is a prize worth chasing.

We believe the real benefits of generative AI and their effect on businesses will become more apparent in the medium term. This technology will change how work is done. It can also reframe your enterprise. For instance, where you play and how you win.

The danger will come if AI is plonked on top of old processes, old systems and biased data. Not understanding generative AI before making use of it will be dangerous. Strong principles to govern the use of AI will be essential. We have to ground this technology to reduce the possibility of harm. Of course, costs and lock-in will still be issues as the technology moves into the mainstream.

**Human-machine interaction**

Organisations will be liable for the outputs of generative AI just as they are for the work delivered by their employees. Navigating the risks of human-machine interaction will be important for all organisations.

At HCLTech we believe that machines need to be used to amplify human impact — and hence boundaries are needed. This is especially true for generative AI, and humans should make the final decisions on AI-suggested outputs.

Anyone who has travelled in a car with self-driving capabilities will have experienced amazement, exhilaration and terror. You learn to trust the car to brake in time, navigate a roundabout or go across a winding hilly road. Driving in such a car convinced me that the humans who interact with generative AI machines will need robust training. They will need a thorough understanding of how the technology is used and where it can fail.

Careful management of human-machine interaction will ensure that generative AI is used safely and responsibly but the journey is likely to be long and bumpy.

In the near future the skills required to use and develop technology more generally are likely to change. The demand for quality control and human oversight of AI-generated content will grow significantly. Closing the skills gap will be essential. We should pay particular attention to these areas:

- **Bias and fairness:** We have to be aware of the biases inherent in generative AI and take steps to mitigate them
- **Explainability:** The way generative AI works can be confusing to the uninitiated. We need people who fully understand the models to provide explanations. This will help everyone to place more trust in AI outputs.
- **Safety:** AI models can generate harmful content and hallucinate. We have to be able to identify and manage this phenomenon.

Only when organisations achieve an end-to-end, closed-loop system — with humans and machines optimised to work with each other — will we begin to see dramatic benefits.
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