

# A Glimpse Into the Minds Behind AI

ChatGPT has been on the scene for 18 months, but did you know that AI has been in the making for nearly 75 years? Talk of AI has taken up hefty real estate in important journals and news channels over the last year. But if 2023 was the year for becoming acquainted with AI, 2024 is all about optimizing it. 68% of CEO's believe that if AI was fully implemented in their company, their business would see unprecedented growth, which would not be possible without it.

Among many of the CEO's and executives we work with, it is a top-of-mind conversation. But still, most individuals are busy and overwhelmed and they're not thinking about the implications of AI beyond a quick edit or summary of text. It's essential to soak in the topic to get to the potential for innovation and expansiveness, which is why we started with the early history of AI. As we enter into a new year focused on optimization and performance, leaders are wondering: "how much should we be paying attention to AI?" and "what should we be doing about it?" We'll help you clarify your goals on those two key questions in this next segment.

In the first part of this series, we took the opportunity to ground ourselves in history. Beneath the glamor and shine of ChatGPT, there is a rich history of intensely smart individuals with a powerful vision for the future. Through understanding the strategy and the origin behind AI, we can better use it to its full potential. In this first segment, we explore the interior worlds of the scientists who developed the concept of artificial intelligence over decades and then look at how AI is being integrated to optimize business practices at present.

Despite the promise of AI, it's not the first time that substantial change has been met with fear, avoidance, or resistance. At first, business leaders felt trepidation about the new technology. Some had the fear that they would fall behind and others resisted, concerned that it would replace human thinking and innovation. However, once leaders began to experiment with the new technology, this feeling of alienation was often quickly replaced with curiosity. Tools like ChatGPT freed up time from tedious tasks, helped with writer's block, analysis paralysis, and freed up deep thinking and creative tasks. Our goal is to help you think about how AI can best work for you.

If you're looking to learn more about how to ground yourself in AI to optimize your business and your personal development, this whitepaper will guide you through a deep dive. You'll learn:

- 🕒 The history and key thinkers behind AI
- 🕒 The foundations of AI thinking
- 🕒 How to apply AI to your business
- 🕒 10 examples of how AI is used across industries
- 🕒 Where AI is headed



# Why You Should Read This AI Report

For the last year, most of us have felt inundated with the buzz of AI. At times, it feels like technological advances are moving at the speed of light and that old, practiced ways of doing things are at a standstill. It's hard to wrap your arms around it, to understand its uses, potential, and how things might change because of it. And we know there's a sense of urgency out there, especially amongst those keen to learn, lead, and optimize. That's why we decided that AI was a crucial topic—for us, for you, for anyone who wants to make an impact (and not get left behind).

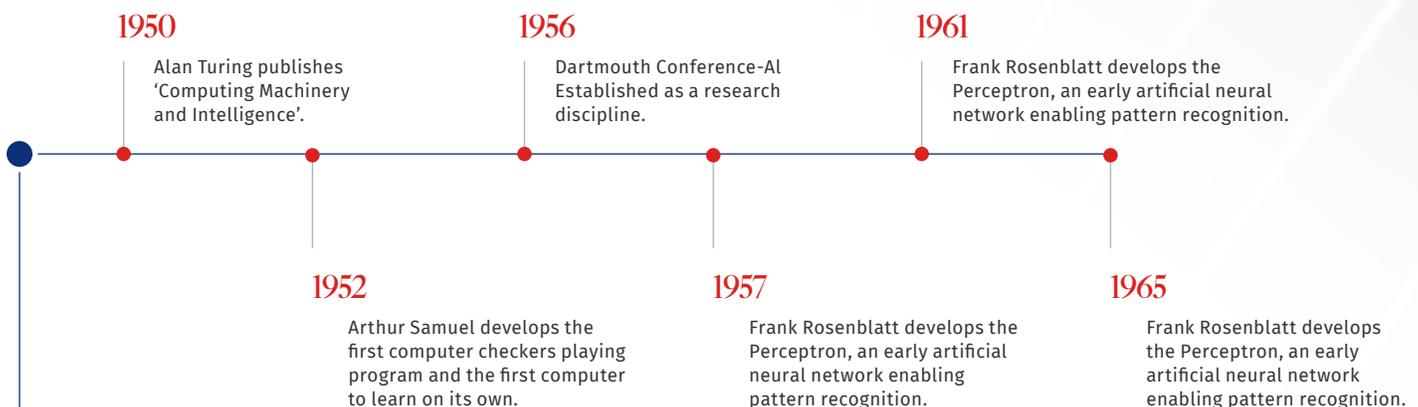
The truth is that you are not alone. The implementation of AI is the leading concern for exec.'s across the world. Not only that, but ethical implementation is top of mind. Leaders want to bring clarity to this fast-moving field. In this AI report, we're going to get grounded in the big brains that brought AI to where it is today, as well as the practical uses of AI across industry, and the projections for the future. Some of the scientists we'll introduce to you have been working on AI since the 50s! We'll talk about what's happening in the field, and how it might be applied to your business. This is your no-nonsense version of how it all got started, how it's going, and how you can stay on trend with your business endeavors today.

But before we start, it's essential to break down the difference between traditional and generative AI.

Think of traditional AI as the subset of AI that performs present tasks using predetermined algorithms and rules. This type of AI does extremely well at a single task, for instance disease diagnostics, language translation, or excelling at a game of chess. Think also of Siri, or Alexa, or the recommendation systems on Netflix or Spotify. Traditional AI is great at its job but while smart, it is not responsive. Trained on massive amounts of data, the system learns to identify patterns in the data and generate outputs. But, it doesn't color outside of the lines.

Generative AI is the next generation of artificial intelligence. The fundamental difference is that generative AI can create something new. So, while traditional AI sorts from what's there, Gen. AI can produce video, images, or text. However, they are still informed in similar ways to traditional AI. Gen. AI is also inputted with a large amount of data to train its underlying patterns. In this way a prompt leads it to create a design based on similar patterns. Machine learning is an essential component of what allows generative AI to function. Both forms of AI have a crucial role to play and can help you grow your business.

## An AI Timeline: 1950-1965



# The Thinkers Behind AI

If you want to understand AI, you have to understand it from its conception. When you dig beyond the flurry of tabloids, Chat GPT, past all the hype and down to the roots, you will see something much different than the fine, complex wiring of mysterious machines. You will see nerve endings firing, parts of the complex human machine—the brain—which is after all, the model on which AI is premised. In fact, behind all the shiny tabloids featuring the latest on ChatGPT, there is a man of 75 years of age, one of the greatest minds behind AI. In his spare time, he can be found preserving dragonflies or observing snakes. If you want to know how AI works, look no further than its forefathers. Start with Geoffrey Hinton.

Despite his vast array of interests, Hinton was primed with the genetics to achieve in the sciences. A glance at his eccentric family tree shows that much is clear. Take for instance, his great-uncle, Sebastian-Hinton who was the inventor of the jungle gym, Lucy Everest, the first woman to become an elected member of the Royal Institute of Chemistry, Charles Howard Hinton the first to come up with the mathematical principle of a doorway into the fourth dimension, James Hinton, a leading ear surgeon, his grandfather, the founder of Boolean mathematics, George Everest, the namesake for Mt. Everest. Not to drag on with a list...

## An AI Timeline: 1965-1980

1965

Joseph Weizenbaum develops ELIZA, an interactive program that carries on a dialogue in the English language on any topic.

1970

The first anthropomorphic robot—the WABOT 1—has a limb-control system, a vision system, and a conversation system.

1979

Kunihiko Fukushima develops the neocognitron, a hierarchical, multilayered, artificial network.

1966

Shakey the robot is the first general purpose robot to be able to reason about its own actions.

1972

MYCIN, an early expert system for identifying bacteria causing severe infections and recommending antibiotics is developed at Stanford University.

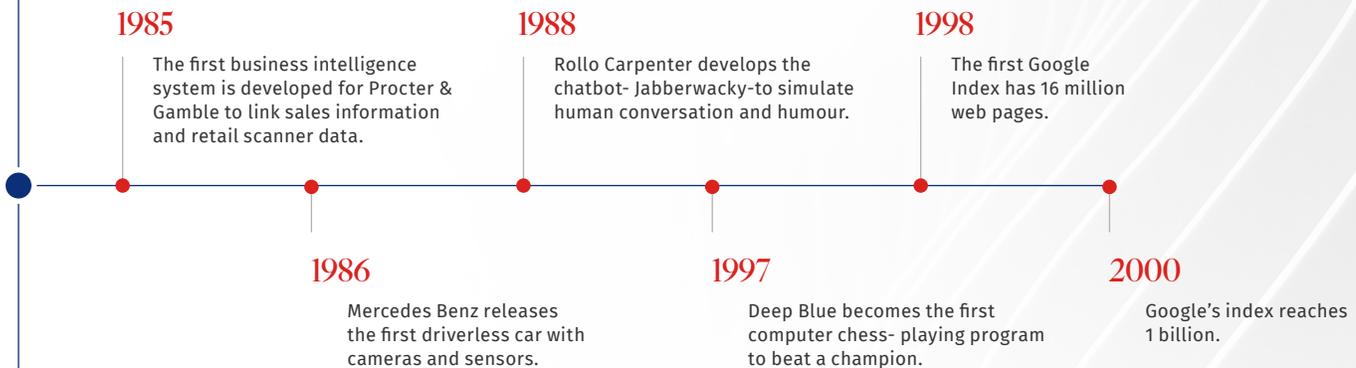
1980

Wabot-2 is a musician humanoid robot able to communicate with a person, read a musical score, and play an electric organ.

# A Niche in Neural Nets

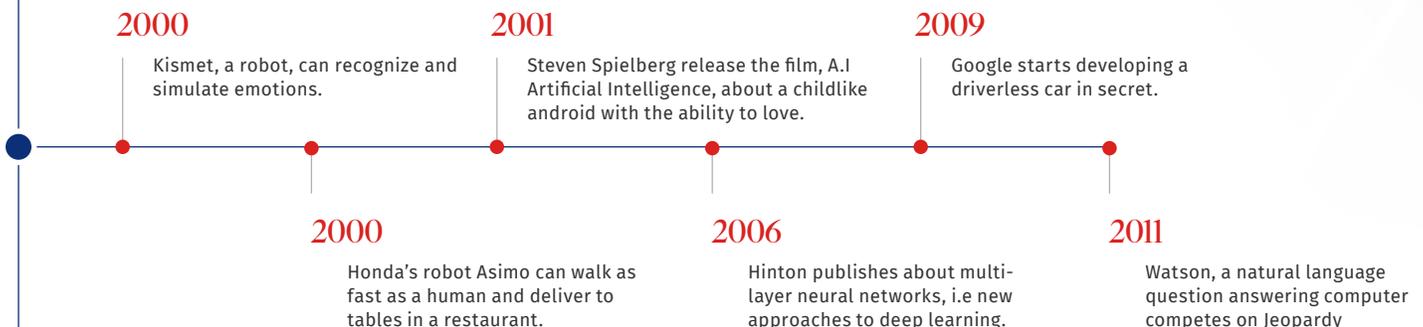
Genius but understated, Hinton roamed from subject to subject in university before finding his fit in experimental psychology, where he would encounter Bernard Williams, a pioneer in his field. Bernard Williams was interested in computers and the mind, though it would be a long while before this field was recognized for its worth. Under Williams' mentorship, Hinton remarked that our various thoughts represent different physical arrangements in our brains. The basis of his thinking and the field he would develop is something called neural nets. This was different from the traditional way that computers operated, with software independent of the hardware. The study of neurons and their application to machine learning is a part of a field called connectionism, which combines math, philosophy, neuroscience, and programming. It was new territory.

## An AI Timeline: 1985-2000



What Hinton knew well was that your brain is a network of neurons, and this network of neurons became the blueprint for AI. The network is constantly changing. Every thought, every new experience, every encounter, every action, causes it to change shape. Some shape-changing is transient, like a brief encounter at a cocktail party, and others strengthen—an encounter which changed the course of your life. Your machine is infinitely complex, expansive, and evolving. It is hard to see and to understand, and people like Geoffrey Hinton have dedicated their lives to learning more about it and...replicating it, so that tasks in the everyday world become simpler and humans make greater progress. Hinton spent his career building bigger neural nets off of this model. He employed the brightest graduate students to assist him, to help him improve these systems, but he didn't necessarily think he would live long enough to see the idea take off. His idea proved more timely than he thought when Google acquired his startup in 2013, which had massively improved image recognition using neural nets. He was on to something.

## An AI Timeline 2000-2011

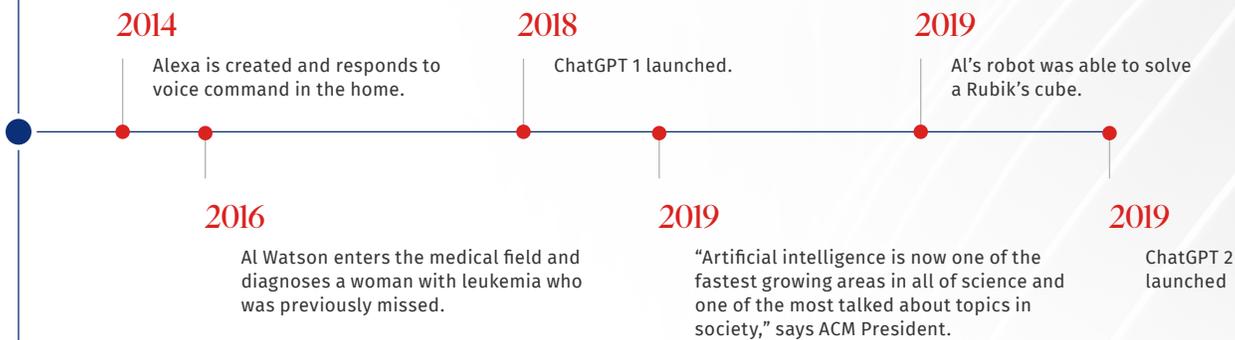


# Origins: The Turing Test

Hinton, while outstanding in his field, is one of many extraordinary thinkers behind what we now regard as AI. Another thinker involved in the world we now speak of as 'Chat GPT' is Alan Turing. Turing emerged in the 1950's with an academic interest in the mathematical possibility of artificial intelligence. His thinking was this: if humans can use information to reason, solve problems, and make decisions, then why can't machines? Turing developed the Turing test to define a standard for machine intelligence, which formed the basis for artificial intelligence, and the Turing Machine, the premise for computers to come. Still, the early enthusiasts encountered some problems. Computers couldn't store enough information or process it fast enough. Understanding relied on knowing a large grouping of words in various combinations, and so despite the ambition, the advances were at a stall.

Though less publicized, there were powerful landmarks before the release of ChatGPT. In 1997, for instance, reigning chess world champion and grand master, Gary Kasparov, was defeated by an IBM program called Deep Blue. It was the first loss to a computer. Next, Dragon Software for speech assistance was introduced to Windows, not to mention a robot named Kismet that could express emotions. These rising signs gave a glimpse that AI could be great. What had been missing? It certainly wasn't the inadequacy of the great minds, but the processing and storage capabilities of machines at the time. The potential for artificial intelligence was seemingly unlimited.

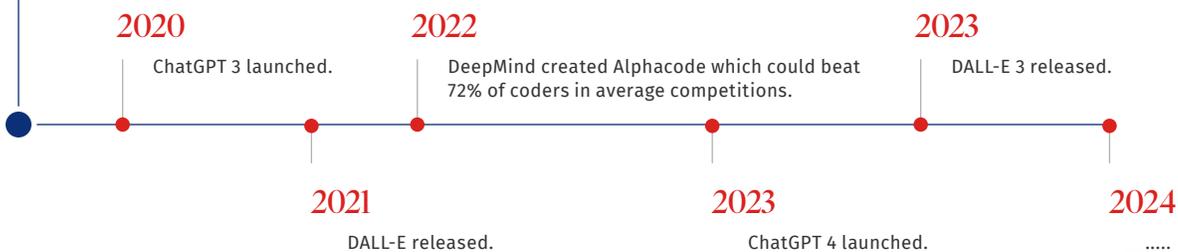
## An AI Timeline: 2014-2019



# Take it to the Limit

How can you make the best of AI in your organization to achieve efficacy, simplicity, and meaningful impact? It starts by understanding individuals like Hinton and Turing and their intention behind the tool. Through understanding the principles that motivated their work, we are better equipped to put AI to good use and to implement it in our businesses and personal lives to realize its potential. The Turing Test and neural nets are vastly complex, but they unify around a singular theme: human thought powers human decision making. Since AI is powered to make decisions based on encoded information which resembles human intelligence, the best we can do is to use our unique cognitive abilities to push AI to higher limits. Practice the questions you ask on Chat GPT. As a team, workshop your approach.

## An AI Timeline: 2020-2024



# AI in the Real World: 6 Examples to Replicate

To consolidate our understanding of AI, we looked into how different industries were using AI to make a significant difference to their work and the growth of their organization. Here are some of the ways leaders are thinking about AI:

Two questions were top of mind: what is the most useful application of AI in each business, and what is the biggest opportunity for AI in the future? We examined case studies across the travel industry, medical school, suicide prevention, journalism, agriculture, and athletes. Here is a look at what we found.

## — 01 —> Medical School

In the past, we have known that technology assists medical practitioners. Only recently has the medical field been opened to the knowledge that AI can fill medical roles on par with human experts. It is anticipated that over time, certain roles in medicine will be replaced by artificial intelligence. Here are some key ways that AI is hard at work in medicine:

- AI-developed classification models help doctors diagnose psoriasis, skin cancer, and skin lesions.
- A convolutional neural network was trained to classify images between keratinocyte carcinoma or seborrheic keratosis and malignant melanoma or benign nevus.
- AI systems could classify skin cancers with the competence of a dermatologist.
- AI was trained to classify images of diabetic retinopathy and macular edema for adults with diabetes.
- AI has been involved in the development of drugs for Alzheimer's, Parkinsons, and ALS.

Companies like BotMD have 24 systems answering to concerns about physicians on call, prescriptions, and clinical tools.

### Here are some global organizations using AI in medicine:

- AiCure (NYC) - Video, audio, and behavioral data to understand the connection between patients, disease, and treatment.
- Aidence (Amsterdam) - AI for radiologists, specialization in lung cancer.
- Aiva Health (LA) - Links patients to the right physician.
- BotMD (Singapore) - Answers clinical questions.
- InSipro (San Francisco) - Drug discovery
- Cleerly (NY) - provides 3D images of the heart

AI will free up clinician time, help with admin-related tasks, diagnostics, drug-targeting, and act as a second opinion. According to the National Institute of Health (NIH), "with an estimated 34% of health care costs associated with administrative tasks, AI could save massive amounts of time and money." In time, it could solve medicine's greatest challenges.

## — 02 —> **Suicide Prevention**

South Korea has done a deep dive into the implications for AI in the prevention of suicide. The country has the fourth highest suicide rate in the world. Before South Korea began to examine the use case for AI in the prevention of suicide, there were security workers who attended to CCTV cameras along the 300-mile-long Han River. Still, the cameras were missing individuals. At that point, the Seoul Institute of Technology took on the work of training an A.I tool based upon existing video surveillance footage, so that the technology would be able to identify the pattern of those that were likely to jump off. The program was immensely successful and the city expanded it to other bridges. Experts clarify that the AI is not the first line in prevention for jumpers, but it assists greatly in rescue times.

## — 03 —> **Product Development**

One of our clients used AI to develop all elements of their brand and product line. They started with the intention that they wanted to create a secondary brand. They inputted all of the information about their target market and the specific things they wanted to accomplish into the AI platform. Not only did AI generate a brilliant name and a number of excellent ideas for the characteristics of the product that would become fundamental to the identity of this new product, but it was done in a matter of hours. Using AI, they were quickly able to confirm that the brand wasn't being used by anyone else in their space and then register the brand for trademark. Meanwhile, a vendor would have charged hundreds of thousands of dollars. The cost was minimal and they're thrilled with it.

## — 04 —> **The New York Times**

There's a new staff member on board at The New York Times, and it's a sign of the times. The title of the new hire (Zach Seward) is Editorial Director of Artificial Intelligence Initiatives. The focus of the role is to explore the opportunities and liabilities of AI, as they fit into the organization. Similar to the insistence on human creative thought, problem solving, and productivity that the Flight Centre Travel Group applies to their thinking. A colleague said of Seward, "He shares our firm belief that Times journalism will always be reported, written, and edited by our expert journalists." This no doubt comes as a relief to many. Seward will build a small team and strategize AI training programs to support the development of journalists. The suspected end result of his work is that newsrooms will be more efficient and that the technology will free up journalists of tasks so that they are able to focus their efforts on exceptional writing. Who will you put in charge of AI in your organization and what will they be accountable for?

## — 05 — Agriculture

Farming is changing and AI is behind the transition. Take the organization, Hedgehog, an AGtech startup focused on mushrooms. Since the company began integrating AI, they have almost completely taken human labor out of the equation. They use robotic arms informed by machine learning for every stage of the process. The robotic arms prepare the soil, plant the seeds, harvest, and pack for shipment. Other agricultural companies like Bowery Farming, Sprout AI, Beagle Technology, and Monarch Tractor are experimenting with how they can enhance and automate crop growth.

## — 06 — Athletes

While AI can help humanitarian efforts and solve complex and pressing problems, it also has its dark side. Experts predict that it's more than likely that if individuals are using performance enhancing drugs (PEDs), then they are also using generative AI. In fact, Manolis Kellis, MIT Professor of computer science and artificial intelligence says, "If I were in the doping business, I would be crazy not to use generative AI right now."

Here is where things get nitty gritty. Traditional AI follows, "predefined rules and patterns." Generative AI, on the other hand, drums up content from scratch. That content could and for users may well be, performance enhancing drugs. This has implications on all areas of sports, but specifically on the upcoming Olympic games. Experts believe that the most plausible use for AI would be to use generative AI to change the composition of PEDS which trigger drug tests, making them undetectable.

# Where AI is Headed Today

Amongst AI researchers and developers, there is tension over what it will take to meet the collective mission. That becomes further complicated because AI researchers, for instance at Open AI, are divided on many issues. The leading question is how do we develop AI so that it is humanitarian and does good in the world, as opposed to going too far and doing harm. The trouble is with these moral definitions that they're crowd dividers. There's another problem and that is that as a society, we have let a small group develop this technology that will influence and direct all of our lives without transparency. When it comes to the most consequential technology of our era, we need more voices in the arena. As it stands, each iteration of GPT is about scaling up parameters.

Murray Shanahan, professor of cognitive science and robotics at Imperial College London and principal scientist at DeepMind, sees one key area for expansion and development and that is foundational common sense. When he refers to foundational common sense, he means objects, surfaces (the top, bottom, sides), paths, and all other basic physical things that we have an intuitive understanding for. According to Shanahan, this lays the groundwork for more complex social and moral nuance. It includes animal learning and embodiment and it's missing from AI at present. When asked to predict the big advances in the next 10 years, he says he can't possibly. The best thing we can do is prepare ourselves for some surprises. From Hinton and Turing to Shanahan the potential of AI is cradled.

Here are three questions to consider with your team as we wrap up this segment on AI:

1. Where might AI change our history in the next 3-5 years?
2. In our organization is going to be the expert?
3. What are the things that we should be testing or experimenting with to maximize our potential with AI?

Stay tuned for the next segment of our AI series, which will cover the 2024 predictions for AI.

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