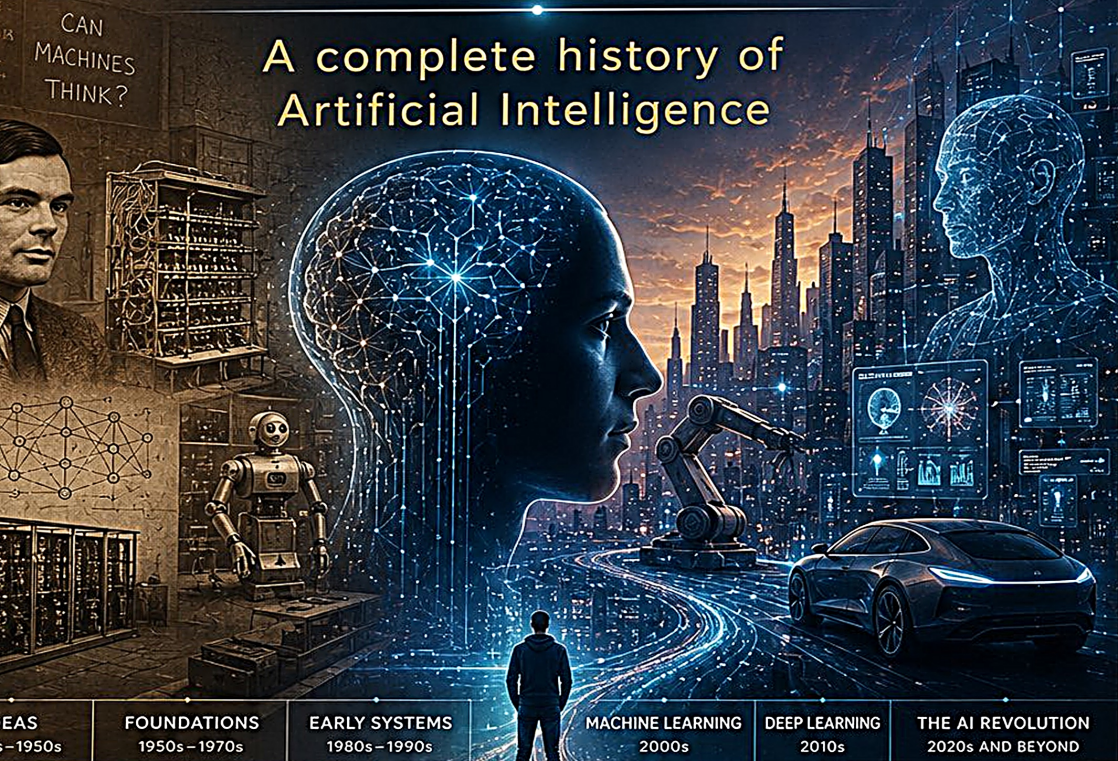


HOW AI CAME TO BE

A complete history of
Artificial Intelligence



PRE-1950s

FOUNDATIONS
1950s – 1970s

EARLY SYSTEMS
1980s – 1990s

MACHINE LEARNING
2000s

DEEP LEARNING
2010s

THE AI REVOLUTION
2020s AND BEYOND

MICHAEL C. CASTELLANO

Aka “MICHAEL AI”

Introduction

It did not happen overnight.

Artificial intelligence, the buzzword of our time, did not appear suddenly out of nowhere. It did not emerge with a flick of a genius's wrist or from the quiet of a lab filled with wires. The truth is more layered, more human, and far more fascinating.

What you are holding is not another cliché book about AI taking over the world. It is a story of ambition, chaos, struggle, and cooperation across industries, decades, and continents. This book was written to uncover how we really got here, to this moment where intelligent systems are reshaping everything from medicine to media. The record has been scattered and often misunderstood.

The goal is to bring it all together and set it straight.

Behind every breakthrough were teams of people who stayed up too late, ran out of money, argued over code, and believed in something the world was not ready to see. The development of AI is not a polished science fiction tale. It requires patience, conflict, failure, vision, and steady experimentation. Above all, it is a story about people.

Reading this book will give you more than just facts. You will see what it took to bring artificial intelligence

Michael C. Castellano

from concept to reality, the people and principles involved, and the moving parts that had to align, often imperfectly, to create something astonishing. You will see the scale of this effort and gain a deeper appreciation for it.

You will also gain a clear understanding of our current moment through the lens of technology and by looking at its social, economic, and philosophical impacts. AI is more than a tool. It marks a turning point in history. As you uncover the story of how AI came to be, you will also begin to recognize the direction in which it is guiding us.

Some of the glimpses ahead are grounded in fact. Ideas and possibilities shape others. But all of them are rooted in a close understanding of what has already happened. That is what makes this book different from speculation and hype. It is built on history, not headlines.

Now, let's talk about the person behind this story. I, Michael Christopher Castellano, am not an academic locked away in towers. I am not a bestselling author chasing trends. I am someone who lived it. This is my first published book, but my journey into the world of business and technology began long ago. At fifteen, I started my first business. At sixteen, I served as a U.S. Senate Page during the 107th Congress, observing the workings of leadership and service in the halls of government.

How AI Came to Be

Years later, I moved to Silicon Valley for college and launched a video production company from my dorm room. That company grew into a software company and later into an artificial intelligence company. Twenty-two years of passion and purpose led to the insights in these pages. This is not a secondhand account. This is my experience, and I will share it with you.

When you complete this book, you will understand the process that brought artificial intelligence to life. You will see the forces that enabled its creation and appreciate the rewards and risks that lie ahead. You will learn not just the mechanics but the meaning behind the machine. You will know how it all began and where we are likely headed.

To appreciate where artificial intelligence stands today, we must first understand the journey that brought us here. This goes beyond tracing timelines or listing milestones. It requires recognizing the spark that made the journey possible: the questions that challenged knowledge, the breakthroughs that expanded horizons, the mistakes that taught lessons, and the curiosity that refused to stop at what was already known.

This is the story behind the story, the inspiration that led to machines learning to think.

My experience is not the only thing that pushed me to write this book. What encouraged me was something simple but important. I realized how many people are

using AI today. They interact with tools like ChatGPT or image generators like Midjourney and are amazed by the results. Some use AI for work or study, while others explore it out of curiosity. Regardless of purpose, one thing is universal: the sense of wonder that comes with engaging these technologies.

The popularity of AI has grown rapidly, yet the history of how it was developed remains unfamiliar to many. This gap highlights how little is known about its beginnings.

That space between amazement and understanding is what inspired me. I found myself asking, if people knew what it took to get here, if they understood the depth of effort behind the tools they use every day, would they view them differently? Would they feel respect, concern, or even responsibility?

I believe the answer is yes.

It is extraordinary that someone like Alan Turing, back in the 1950s, could imagine what we are now experiencing. At that time, computers were massive, slow, and simple compared to anything we use today. Yet Turing saw something in them, a potential so vast that he suggested a future where a machine might become so intelligent, so convincingly human in its behavior, that a person would not be able to tell whether they were speaking to a human or a machine.

How AI Came to Be

That idea became known as the Turing Test. For decades, it remained an aspiration, a goal just out of reach. The world changed, technology advanced, and nothing had truly passed the test for more than seventy years.

Until it did.

About seventy-five years later, my company, Engager, Inc., quietly achieved something that even the most optimistic researchers thought was still years away. We developed a virtual persona, a digital being, and introduced it to a real person I will call only Barbara, out of respect for her privacy. She believed she was on an ordinary FaceTime video call with me. She spoke with the persona the way anyone speaks with a friend: naturally, back and forth, without hesitation. It was only afterward, when we looked at what had just happened, that we understood its meaning. She genuinely had not known she was interacting with a machine.

The machine, nicknamed Michael, passed the Turing Test not in theory, and not in a controlled lab with graphs and benchmarks, but in real life, with a person who believed she was speaking to another human. No one set out to run a formal experiment that day, and that is precisely what makes the moment so meaningful: the test was real life itself. It happened, and it was no accident.

It took decades of effort, hundreds of brilliant minds, entire teams across dozens of companies, and funding

Michael C. Castellano

that may have reached into the billions. It was not one invention. It was a symphony of innovation, stitched together over time by people who believed this moment could come.

And it did.

It is extraordinary that his vision became reality seventy-five years after Turing first imagined it. That is not just an interesting piece of history. It is a moment that should be remembered. It deserves to be told in full.

That is what I want this book to do. I want to tell that story, the whole story. Not just headlines or polished corporate versions, but the real thing: the messy, brilliant, human journey that brought this technology into the world.

Readers can expect to learn the rich truth. At times, it might even seem miraculous. But everything in this book is part of a real story. This is the story of a technology that now touches the lives of millions, a technology that came to life behind the scenes, shaped by a community of thinkers, builders, and dreamers.

We will explore who these people were. The major players include those who became household names. At the same time, we will uncover the individuals who dedicated their lives to this vision. Alan Turing was one such person who believed with all his heart that this moment would arrive. Many others followed and carried

How AI Came to Be

that torch forward. People like Steve Jobs advanced the movement in their own ways.

They all played a part. I want to go deeper. I want to look into the research, trace the developments, and uncover the real story behind the story. I want to acknowledge everyone who moved this work forward. Recognition goes beyond the well-known figures to include all who contributed, whether or not they choose to be named. For those who prefer to remain anonymous, their wishes will be respected. Giving credit is important, and so is honoring personal choice.

But maybe this is also a chance to recognize some of the unsung heroes. The people who were quietly dedicated to the work. The ones who did not seek the spotlight or chase headlines. They were not after billions of dollars. They were not interested in self-promotion. They simply cared about building something meaningful and gave their energy to that purpose.

Maybe this book is a way to say: We see you.

Or perhaps it gives voice to some people who never imagined they would be mentioned. Maybe it offers recognition to those who truly made a difference.

We face something greater than a tool because it carries profound implications for our future. It is more than software. Just think about how many people are using this today. Think about how much information it

Michael C. Castellano

carries, how much it can teach, and how much it is already transforming the way we live and work. This technology is going to shape a completely different world.

However, when something is booming, different perspectives about it multiply as well.

There is someone the world calls the Godfather of AI: Geoffrey Hinton. He is a deeply respected figure, and he has earned every bit of that respect. His work on backpropagation in the 1980s and on AlexNet in 2012, both of which you will read about in this book, helped build the very foundation of modern artificial intelligence. Yet in recent years he has been making a lot of doom-filled statements. He talks about AI empowering authoritarianism. He warns that it will widen the gap between the rich and the poor.

I want to give credit where credit is due. Few people alive have contributed more to this field than he has, and when someone of his stature raises concerns, those concerns deserve to be heard, not dismissed. But after more than two decades of building in this space, I see the same technology through a very different lens. I just do not share his outlook.

My perspective is very different.

I actually believe that virtual intelligence, or digital intelligence, is going to raise everyone's standard of living. I think it has the potential to create a cleaner, safer, more

How AI Came to Be

equitable, and more peaceful world. That is the direction in which I see this heading.

I am happy to be clear and specific about the future. I can discuss what might unfold in two years, three years, ten, thirty, or even fifty years. I can break down the possibilities because I do not see doom and gloom. Instead, I see opportunity.

I think it is important that people understand what we are really talking about. For one thing, the name is misleading. Artificial intelligence is not a very accurate term. It is *not* artificial. There is nothing fake about it. It is not imaginary, and it is certainly not a trick. It is real. It is virtual. It is digital. It is intelligence that operates in a different form than our own.

We have biological intelligence. That is what human beings are born with. It lives in our bodies, carried by neurons, cells, feelings, and intuition. Digital intelligence, on the other hand, lives in servers and computers. It operates not through instinct or emotion but through data, logic, and patterns. It functions within the realm of numbers and reasoning. Unlike biological intelligence, it does not possess a body or experience sensations such as pain, yet its growing influence on our world cannot be ignored.

Given these differences, there must be a clear distinction between biological and digital forms of

intelligence, not to separate them but to understand how each contributes to shaping our present and future. This could be the subject of its own chapter, exploring how both types of intelligence, though different in origin and function, are powerful in their own ways.

Digital intelligence, which I prefer to call virtual intelligence, will not emerge solely from lines of code or algorithms. It will be guided by people—thinking and feeling individuals who bring intention, morality, and care into its development.

This is our story, too.

I don't believe the future will be doom and gloom. In fact, I think it will be incredibly positive. In my view, virtual intelligence will help expand human consciousness. It's not here to replace us, but to work with us, to elevate the way we think, perceive, and innovate.

I actually believe this process is cyclical. Biological intelligence creates virtual intelligence, which then helps elevate biological intelligence. It's a spiral of growth. A kind of evolving wheel, where human and machine intelligence refines itself through mutual collaboration. We improve the machines, and the machines, in turn, improve us. The result is expansion on every level: material, intellectual, and even spiritual.

This symbiotic relationship between humans and machines could lead to unprecedented acceleration, not

How AI Came to Be

just in terms of technology but also in our understanding, awareness, and consciousness. I truly believe this, and I think there's solid evidence to support it.

By this book's end, readers will feel a sense of relief. A calm confidence. Despite the loud voices predicting apocalypse, extinction, or authoritarian collapse, there is another side to the story. Yes, we should examine those worst-case scenarios. We should discuss them, take them seriously, and be prepared. However, when we look at historical data, the trend is clear.

With technological innovation, the world has consistently improved. Take Peter Diamandis's TED Talk, *Abundance is Our Future*, for example. He walks us through key global indicators. Literacy rates have risen. Infant mortality has dropped. Extreme poverty has been reduced. Hunger has declined. And not just in one region but across the globe. From Florida to Southeast Asia. Over the last 50 years, 100 years, even 1,000 years, human life on this planet has steadily improved by nearly every measurable standard.

Technology, when guided wisely, tends to lift the standard of living. So, while we must absolutely address potential threats, we also need to recognize the power of innovation to move us forward.

That said, strong policies are essential. We need smart, enforceable laws that keep artificial intelligence in check.

For example, if someone creates a video that looks real but is entirely generated by AI, and that video could mislead, scare, or deceive someone, there should be a legal requirement. It must state that AI created it somewhere in the metadata or even visually on the content itself.

We cannot allow artificial intelligence to be used for deception or manipulation. There needs to be accountability. A clear, common-sense approach says: create what you want, innovate boldly, but be transparent. People must be able to distinguish what is real from what is generated.

The future brings challenges but also immense progress. If we are thoughtful, collaborative, and honest in building and regulating these tools, the future can be not only brighter but extraordinary.

If AI creates something, whether a video, image, voice recording, or text, it must be clearly disclosed through metadata or visible on the screen. This is especially critical when the content could be misinterpreted or cause harm. Simple policies like this are not about stifling innovation. They are about maintaining trust, protecting the public, and establishing boundaries in an era of rapid technological change.

Now let's talk about job replacement. It is not enough to say, "AI is here, and jobs are gone." Disruption without accountability is unacceptable. If an organization wants to

How AI Came to Be

implement AI at scale and replace human roles, a mechanism must be in place that shows real improvement in people's lives.

We should ask: What happened to the individuals whose jobs were affected? Did their careers progress? Did they earn more? Did they find more meaningful work? Did their quality of life improve? If data cannot back those answers, then full-scale deployment should not move forward.

AI must be a tool for elevation, not displacement. If it can free us from tedious labor and open the door to more fulfilling work, we must show this clearly with transparent evidence. Proof should leave no doubt and demonstrate measurable impact. If a system improves job satisfaction, increases income, allows more time for family, enhances health, or brings other benefits, it should be embraced. If not, we need to pause and reassess.

This is not about slowing progress. It is about making sure progress works for people, not against them. Guardrails like these ensure virtual intelligence serves humanity's highest good. Policies like this are practical, enforceable, and grounded in fairness. They are essential if we want AI to be a force for widespread benefit, not narrow gain.

It is easy to picture a future where these technologies help us explore other planets or even the galaxy. The

Michael C. Castellano

reality is, we have not set foot on Mars yet. I certainly have not. Have you? No, I have not either. Maybe that day will come. Our focus must remain on building a solid foundation here on Earth, where the impact is immediate and vital. Let us begin by examining AI pioneers' work and the lasting influence they left behind, starting with Alan Turing.

How AI Came to Be

Section 1

Chapter 1: Alan Turing and the Beginning

Before there were intelligent machines, before there were algorithms shaping our daily lives, there was a man who imagined the unimaginable.

His name was Alan Turing.

In many ways, the story of artificial intelligence begins with him. He was not only a brilliant mathematician and logician but also someone who dared to ask questions that most people of his time could not even begin to understand. What does it mean to think? Can a machine ever do it? And if it could, what would that say about human intelligence?

This chapter is a journey into the life and mind of Alan Turing. It explores how his groundbreaking ideas laid the foundation for what we now call artificial intelligence. Turing not only contributed to the field, but he also created a new way of seeing the world. His work during the Second World War, his theories about computation, and his vision of machine intelligence were ahead of his time and deeply human at their core.

Our book's beginning is about him, and that is not only because he was the first pioneer of AI. It is also

How AI Came to Be

because what he stood for created the foundations on which we stand today.

He represents the spirit of curiosity, the courage to think differently, and the quiet strength of those who imagine something far beyond what already exists. Understanding Turing is not only about understanding the roots of AI but also about appreciating the person behind the science.

Let us step into his world and see how it all began.

Alan Mathison Turing was born on June 23, 1912, in London, England. From a young age, he displayed an unusual brilliance that set him apart. He had a natural gift for mathematics and a way of thinking that often seemed detached from the ordinary. He was curious, quiet, and intensely focused. While other children played, Turing solved puzzles, experimented with numbers, and asked deep questions about how things worked. It was clear even then that his mind operated differently.

He received his education at prestigious institutions such as Sherborne School and later King's College, Cambridge, where he earned a first-class honors degree in mathematics. His work at Cambridge soon attracted attention, and it was during this period that he began developing ideas that would change the world.

One of Turing's most profound contributions came in 1936, when he introduced the concept of what is now

known as the Turing Machine. At its core, the Turing Machine was a thought experiment. It was not a physical device, but rather a theoretical model that described how a machine could carry out any mathematical calculation if it followed a set of instructions.

This machine could read and write symbols on an infinite tape, moving step by step according to rules that governed its behavior. Simple as it may seem now, this idea was revolutionary at the time.

The Turing Machine was important not just because it explained how machines could process information, but because it helped define the very limits of what is computable.

In other words, Turing gave the world a way to understand what a machine could and could not do. This was long before computers as we know them existed. Yet his ideas formed the foundation of modern computer science.

Turing's vision showed that complex operations could be broken down into simple, logical steps. It was this insight that would later make artificial intelligence even imaginable. Without the Turing Machine, there would be no algorithmic thinking, no coding as we know it, and perhaps no AI at all.

His invention did not make headlines at the time, and few people outside academic circles truly understood its

How AI Came to Be

power. But today, almost every computer program, every digital system, and every intelligent machine owes something to the basic ideas Alan Turing put forward. His machine was not just a model of computation. It was a glimpse into a future he could see, even when no one else could.

If the Turing Machine opened the door to the idea of machines doing calculations, the Turing Test stepped into something much deeper. It was Alan Turing's way of asking a question that still matters today. Can machines think?

In 1950, Turing published a paper called *Computing Machinery and Intelligence*. In it, he suggested a new way to look at the idea of thinking. Instead of trying to define what thinking is, which is very hard even today, he asked a different question. What if we could tell if a machine is intelligent by how it behaves?

Alan Turing created a test he called the Imitation Game. In this test, a person would type messages to two others. One was another person, the other a machine. If the person could not tell which was human, the machine was said to show intelligence.

The idea was simple but powerful. Turing believed intelligence was more than solving problems or doing math. It was about using language, answering questions, and holding a conversation in a way that felt human. If a

machine could do that, it might deserve to be called intelligent.

The Turing Test changed how people thought about machines. Before this, machines were seen mostly as tools that followed commands. Turing suggested something more. He showed that machines could one day think in ways close to human thought.

The test raised questions that went beyond science. Could a machine be creative? Could it understand feelings, make jokes, or show kindness? These were not only technical questions but human ones. They asked us to think about what it means to be human.

Even today, the Turing Test is part of discussions about artificial intelligence. Some machines have come close to passing it, while others make us wonder what “passing” really means. The fact that the test still matters shows the depth of Turing’s idea.

The Turing Test was not just technical. It was also human. It asked us to imagine a future where people and machines could talk, think, and understand one another.

Turing’s work opened a larger conversation about human and machine relationships. What does it mean to think? What does it mean to be human? And if a machine can act like a person, how should we treat it?

How AI Came to Be

This marked the beginning of the philosophy and ethics of artificial intelligence. Turing showed that building machines was not only about logic and wires. It was also about values, choices, and responsibility.

His questions led people to think about psychology, morality, and behavior. If a machine can make decisions, can it be held responsible? Should it be treated with care if it seems to feel emotions? What would it say about us if a machine could copy the way we speak and think?

These are not simple questions, and they have no easy answers. But they remain important. As AI becomes part of daily life, we face the same challenges Turing first pointed out. How do we build machines that are fair and respectful of human dignity? How do we control systems that may one day outsmart us? How do we protect our humanity while teaching machines to act more like us?

Turing never claimed to know all the answers. What he did was start a conversation that continues today. That conversation has grown into the fields of AI ethics and philosophy, which explore how we build intelligent systems, how we use them, and what kind of future we create with them.

The work of Alan Turing was not the only thing that started artificial intelligence. It was also the beginning of thinking deeply and responsibly about what intelligence means for all of us.

While Turing laid the foundation for thinking about machine intelligence, others began building on his ideas in more practical ways. In the 1940s, Warren McCulloch and Walter Pitts created a model of artificial neurons. These were simple units designed to copy how the human brain works. Their work later influenced the development of neural networks.

Then, in 1956, John McCarthy introduced the term “artificial intelligence”. He organized the Dartmouth Conference, which is widely seen as the official starting point of AI as a field of study. Together, these efforts helped shape the early ideas of what intelligent machines could become, alongside Turing’s groundbreaking work.

Even though Alan Turing introduced his test many decades ago, the questions he raised are still part of how we think about artificial intelligence today. In fact, many of the core ideas behind modern AI can be traced back to the Turing Test. His vision continues to shape how we design, measure, and understand intelligent systems.

One of the main principles in today’s AI is the idea that machines should learn to interact with people in a natural way. Whether it is a voice assistant, a chatbot, or a translation tool, modern AI is built to understand and respond to human language. This is exactly what the Turing Test was about. It asked whether a machine could

How AI Came to Be

hold a conversation that felt human. Today, we see that goal everywhere.

Another principle in AI today is adaptability. Intelligent machines are expected to learn from data and improve over time. This means they should follow instructions and adjust to new situations. While more advanced, this idea still adheres to Turing's original concept. He envisioned machines that could process information in steps, follow logic, and exhibit flexible behavior. Modern AI builds on this by using more complex data and faster computing, but the foundation remains the same.

Fairness and ethics are also major concerns in AI today. We want machines to give balanced results, avoid harmful biases, and make decisions that respect human values. These ideas also come from the questions Turing raised. If a machine can act like a human, then it must be treated with the same care we give to human decisions. We must ask not only what a machine *can* do, but also what it *should* do.

Even the way we evaluate AI systems today often reflects the spirit of the Turing Test. Many tests still focus on how well a machine can understand, respond, and engage with humans. If it feels natural and makes sense, and if people feel they are being understood, the AI is seen

as successful. That basic idea comes from Turing's original vision.

Of course, AI today is far more advanced than anything Turing could have built during his lifetime. We have deep learning, neural networks, and massive data systems. But the heart of the idea remains the same. Can a machine understand us? Can it think with us? Can it act in ways that feel real?

Turing may not have known all the details of what was coming, but he gave us a way to think about it. His test was not just a test. It was a guide. And even now, it helps us ask the right questions as we build the future of AI.

Hence, Alan Turing did not just help build the first ideas of computers. He helped shape how we think about intelligence itself. Through his work, we learned that machines could do more than follow commands. They could learn, respond, and even mimic human thought in ways that were once hard to imagine.

His Turing Machine gave us the basic idea of how computers could work. His Turing Test showed us how we might one day speak to machines as if they were people. And his questions about thinking, feeling, and understanding helped open the door to the deeper ideas surrounding artificial intelligence today.

Turing was ahead of his time, but his thinking still lives on. Every smart assistant, language model, and AI

How AI Came to Be

program that tries to understand what we mean and how we feel is all part of the path he started. We are walking in his footsteps, even now.

More than anything, Turing reminds us that behind every great machine is a great idea. Behind every great idea is a person who was brave enough to ask, *What if?*

As we move forward in the world of AI, it is important to remember where it all began.