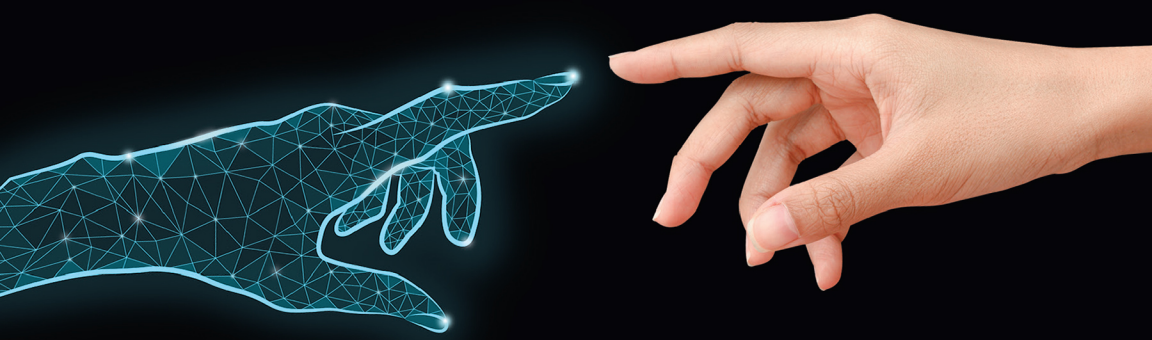
A NEW AGE OF REASON

HARNESSING THE POWER OF TECH FOR GOOD



LARRY WEBER

FOREWORD BY DAVID KIRKPATRICK

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Foreword

We live in a sea of technology – it surrounds us and affects every aspect of our lives, mostly in ways we could not live without. But it's too easy to take this blessing of capabilities for granted. Most of us have become so habituated to technology's marvels that we barely even notice them. It's easier to get annoyed when our smartphone battery runs out or a wire doesn't work, for example, than to feel grateful for the truly astonishing feats the device enables for us the rest of the time. None of us will leave home without it. But the smartphone is just one of innumerable amazing technologies that grace our lives.

Larry Weber wants us to stop and marvel. But more than that, he sees the gifts of tech as an inspiration. He believes in the almost infinite potential of innovation to improve our companies, our lives, and our societies.

Even as we collectively face the myriad crises of global warming, threats to democracy, ongoing wars, and fears about the potential downside of artificial intelligence, Weber sees amazing new pathways to progress.

Yet, we also all live, today, in a sea of pessimism and fatalism. Everywhere, even well-informed people increasingly feel paralyzed, even hopeless. Considerable numbers of young people are so demoralized they are starting to say they don't even want to bring a child into a world they see as blighted and degrading.

In this book, Weber makes the case that they are simply not seeing what's happening. He is a relentless, committed optimist – or, as he calls himself, a "techno-optimist." Combatting society's endemic fatalism is a big part of Weber's mission. As he enthuses near the end of this bracing book, "We are on the cusp of a new era where technology has finally evolved to deliver amazing benefits to the world."

For Weber, this is no idle claim. He has come to that confidence, as he recounts, through decades of close observation of what actually happens in the tech industry. He's served tech companies for many years as a senior counselor and advisor on communications and strategy. The book sparkles with recollections of time spent with visionaries like Steve Jobs and Tim Berners-Lee, who created the world wide web and the first internet browser. Weber recounts many stories about the vast progress that technological innovation has enabled and can enable in the future.

But alongside his optimism about technology, Weber also is enormously optimistic about the power of business. He's written this book to inspire businesspeople to think differently about their work as business leaders, so that they can leverage the potential of technology to help construct a better world. It's a handbook for how to create value in a world infused with deeply-promising technologies. Weber believes embracing tech can help companies remake themselves for the world's benefit.

This is urgent, because companies and business generally face urgent pressure to demonstrate the social value of their organizations. For alongside that fatalism about the future, many in modern society also hold a deep cynicism about the role of business, or even its culpability in bringing us to what they see as the world's sorry state. People will no longer tolerate inaction in any realm; they are so upset and worried.

Weber gives business leaders a call to arms, not to fight back but to inspire – to methodically find ways to turn companies into engines for social good. It is the mission of our age. But it's not easy. Tech is complicated. Luckily, Weber is good at explaining it.

For over a decade I ran a conference and media company called Techonomy. It was dedicated, among other things, to the notion that every company is a technology company. When we began in 2010, that idea was seen by most business leaders as radical, even nonsensical. Today, it is practically a given. Larry helped me understand that from the beginning. He was a big part of the Techonomy community, which I always deeply appreciated. He knew even then that every company was a tech company. And he believed that every business leader has a critical responsibility to engage with and embrace technology, regardless of their industry.

With this book, he has finally set out to explain just what that responsibility means. He is an advocate of what he calls "the moral corporation." It's all about contributing to a better world. Companies that do so will thrive, he argues. His message is meant for business leaders who are rethinking the direction and ethos of their companies – a process he believes is indispensable and urgent. Business leaders are in a spectacularly good position, he argues, if they take stock of the transformations and possibilities all around them.

Much of the book is devoted to carefully explaining and assessing a range of important technologies that are poised to deliver spectacular value to the world. Artificial intelligence tops the list, unsurprisingly. But Weber also explains the importance of cloud computing, quantum systems, emerging energy technologies, and the potential of biotech. But even more importantly, he explains, they can all increasingly work in concert. The combination of all these now-highly-evolved capabilities bequeaths the world far more

potential than could any one alone. Now, he writes, we have "tools to solve problems that seem unsolvable. They can impact our world in ways never before possible, evolving us into this new era: *A New Age of Reason*."

More than once Weber recounts a famous line spoken by one of his mentors and heroes, MIT's Michael Dertouzos: "Technology should be our slave." Weber wants leaders to learn to willfully and consciously take advantage of technology's power. In his many decades advising tech leaders, he has seen the perils of techno-determinism – the passive deployment of powerful technologies without clear ethical oversight. Several times he mentions the cautionary example of Facebook, a company I wrote an entire book about and now deeply criticize. It moved fast and broke things, to paraphrase its longtime mantra, and the world paid the price. But such heedlessness is neither inevitable nor necessary, he argues.

It all comes down to rethinking business leadership in a time of technological possibility. After charting the six waves of technology that got us here, beginning with mainframe computing, Weber now sees a kind of apotheosis. This new era is one in which tech can be put to service for humanity: "Technology has finally evolved and reached a tipping point in which it can address world problems." With the perspective of someone who has lived this evolution over many decades, his conclusion is deeply gratifying, and empowering.

It won't be easy for businesses to rise to this challenge. It means planning differently, communicating differently, and organizing the corporation differently. Weber advocates, for example, that every company create new positions like a "chief ethics officer" and even a "chief humanitarian officer." Take that, cynics about the role of business!

My own career has been spent writing about big companies, the evolution of technology, and its potential to improve society. Thank you Larry Weber for so clearly and passionately arguing for this essential new shift in business consciousness. I suspect his passion and knowledge will be as inspiring for you as it is for me.

—David Kirkpatrick

Introduction

For the past nearly five decades, I've had the privilege of having a front-row seat to the many waves of technology that have swept across our world, changing everything in their wake from how businesses operate to how we work and live. My focus during these waves was helping companies create new categories for their breakthroughs and market them to the world. However, I've always held a fascination with how technology can solve so many problems across business and our personal lives.

Today, I'm excited to see this next wave of technology break, as it holds the promise to impact an entirely new level of our world: *humanity*. Innovations coming from the digital world, the biotech arena, and the clean energy space hold the promise to address some of our most pressing problems, from feeding an ever-growing population with less land to battling against climate change to delivering better outcomes in healthcare. In many cases, it's the integration of multiple technologies that are fueling these breakthroughs.

This pivotal moment we're in now echoes back to the original Age of Reason, a time when the world shifted to focus on science, technology, reason, and the spark of imagination to find new solutions to the problems of that era. We stand at a similar place today, as technologies have finally evolved to give us tremendous opportunities to better our world. We need to apply those very same concepts to deliver on the promise of this era. Naturally, we also need guardrails for new innovations like generative AI, as we've all seen the damage technology can do when it is weaponized against us.

Along with the immense opportunity this wave of technology presents comes responsibility. Companies must find ways to leverage these evolved technologies to deliver outcomes that positively impact our society. This requires new thinking from the C suite, as the executive team's role will broaden to take on new responsibilities and new levels of problem solving, as well as embracing the ethics and morality required to succeed in this new era.

As companies infuse solving world problems into their business strategies, marketing holds the promise of delivering an entirely new level of

transparency by enabling customers to experience the good a company is doing for humanity, ultimately building new levels of engagement and trust. As such, marketing can become a powerful, self-fueled force capable of building an irrefutable reputation that will attract all constituents, from customers to investors to talent.

In this book, you'll hear inspiring stories of organizations doing just that. You'll also hear from experts across many fields who offer insights into the promise today's technologies hold to solve so many problems that seem unsolvable. I hope when you read it, your takeaway will be to find your place on the path of "tech for good," a powerful catalyst that will transform your brand as you contribute to the greater good of humanity.

PART 1

Technology, Humanity, and a New Age of Reason

CHAPTER 1

A New Wave of Technology to Better Humanity

One of the best parts of my career is that I've had the privilege to sit with CEOs of major companies and ask them this: *What do you want your legacy to be*? Most often, I get the expected answers around establishing their company as the biggest, the best, or the first. But, every once in a while, I talk to a CEO who really gets it, who sees the bigger picture and has aspirations around the good their company can contribute to our world.

This was the case with Deere & Company. When I asked this of Sam Allen (former Deere chairman and CEO), his answer summed up the essence of what this book is all about . . . and how I believe every CEO should think. Most people might logically guess his answer would be to dominate the agriculture and construction business by selling more of those green and yellow machines. But his answer showed how Deere thinks and operates on an entirely different level; the company focuses on the impact it can have on humanity. Allen's answer was to help farmers maximize their land to produce more crops so they can feed the world's burgeoning population . . . and to do all of this in a sustainable way. As lofty as it sounds, that's precisely what Deere is doing.

The "how" is accomplished with innovations that are part of an amazing new wave of technology – one that is ushering our world into an entirely new era. The past several decades have been defined by many technology waves, which have impacted business operations and productivity – personal computing, connectivity, access to information via the web, connecting with each other via social media, and the internet of just about everything.

The wave we are in now stands apart from those before it, because technology has finally evolved to impact a much higher purpose: *humanity*.

Current breakthroughs in AI and robotics, along with leapfrog advances in areas like quantum computing, biological systems, data analytics, sensors, chips, the web, and cleantech (renewables, carbon capture, etc.), have been evolving over decades to reach this point in time. These technologies have built the foundation for a plethora of new innovations that address some of today's most pressing problems, from feeding the world to climate change.

- Computer chips that can fight global warming
- Smart beehives that protect bees to ultimately help our food supply
- Blockchain systems that enable electricity sharing
- Computer vision tech that enables farmers to maximize crops to feed our burgeoning population
- AI/robotics that identify and fight wildfires
- Robotic-assisted surgery that expands the capabilities of a doctor's eyes and hands
- Wearable technology for cows so they emit less methane
- Carbon capture tech that has removed more than a million metric tons of carbon
- Affordable medical diagnostic technology that can be used without electricity or an internet connection to help under-served communities
- CRISPR gene editing technologies capable of addressing everything from blood disorders to cardiovascular disease

These are just a few of the advanced innovations available now or just on the horizon. The proliferation of these types of inventions gives us the tools to solve problems that seem unsolvable. They can impact our world in ways never before possible**,** evolving us into this new era: *A New Age of Reason*.

Science, Reason, and a Passion to Impact Our World

This moment in time echoes back to the original Age of Reason that took place in the seventeenth and eighteenth centuries. This major turning point in history was a time of new thinking, tremendous innovation, and inspired imagination applied to problem solving, as society embraced science and reason to improve humanity. Enlightened thinkers propelled the popularization of science, which revolutionized many aspects of the world, including communications, transportation, medicine, and the textile industry, along with a better understanding of the mechanics of the human body and the natural world. Among the many discoveries of this era are the law of gravity, the telescope, the steam engine, the cotton gin, and the vaccine, along with a breakthrough understanding of blood circulation – all of which had a

profoundly positive impact on society then and are the foundation of many aspects of life today.

Like most innovators, the greats of this era – among them Sir Isaac Newton, William Harvey, Eli Whitney, Edward Jenner – started by asking questions, saw the potential of how science could answer them, applied both reason and the magic of their imagination to "see" what could be, and then set out to create new inventions or theories that changed the world.

This new era presents us with a tremendous opportunity – and responsibility – to follow their lead, applying the combination of today's innovations, reasoning, and the spark of imagination to address today's most critical problems. This is the pressing call for every CEO. Today's business leaders need to think not just about their company's impact on shareholders, but more importantly how their organization can better our world.

Key elements have converged to usher us into this pivotal moment. We are grappling with critical global issues such as the raging battle to save our planet from climate change and the challenge to feed the world. Emerging alongside these problems is this wave of evolved technologies that are enabling our brightest minds to create new, innovative solutions that enhance the well-being of our planet and our population. The last component is a growing financial community focused squarely on investing in these types of breakthroughs to make sure they are brought to market and scaled for impact.

As these components converge, it is creating opportunities for companies like Deere and others you'll read about in this book to heed this clarion call and make a difference in the world. The notion of tech that serves us

well, or tech for good, will not only do good for the world, but also create an entirely new value creation for corporations. When companies use technology in profoundly positive ways to benefit our world, their marketing will become a powerful, self-fueled force capable of building an irrefutable reputation that will attract all constituents, from customers to investors to talent.

Looking Ahead

In the next three chapters, we'll explore this wave of technology's impact on three key world issues: the fight to feed our ever-growing planet with less land, the battle against climate change, and the need to evolve healthcare for improved patient outcomes and better working conditions for medical providers. After that, we'll take an essential look at the critical moral responsibility we have to ensure our innovations are used for good and not weaponized against us.

CHAPTER 2

Agtech and Deere: Tech for Good at Its Best

You may be wondering why my lead example on a new wave of technology would focus on one of the oldest occupations on the planet, farming. And you may ask why this is even relevant when farmers represent only 2% of the US population. Well, that 2% shoulders the tremendous responsibility of feeding the other 98% of us. And that 98% is expected to grow from 8 billion to 10 billion people by 2050.[1]

The world's staggering population growth is only part of the issue. The land itself is another critical problem, as US farmland has been declining

over the past several decades, in part due to the land being converted into developments to meet the housing demand. According to the US Department of Agriculture, acres of land in farms have continued the downward trend with 879 million acres in 2023, down from 900 million acres in 2017.[2] What's more, farmland is expected to continue to decline, while our population continues to grow.

But farmers face more than just those problems. There are also labor shortages, caused by a number of factors, from less interest in agriculture among younger generations to wages to immigration policies that limit the work pool. Climate change is another major factor, as warming temperatures, floods, and droughts have a direct impact on yield. Farmers face all of these issues and more, making the business of farming . . . and feeding all of us . . . extremely challenging and unpredictable.

In his 2023 CES keynote, Deere Chairman and CEO John May articulately summed up both the challenge *and* solution to today's farming. "In the past farmers would grow more by using more. Bigger machines, more horsepower, more seeds, and more nutrients. This approach alone doesn't work today. There's less arable land, less rural labor, less time to do their jobs due to weather volatility, and rising input costs. Technology is the solution to these challenges. Technology allows farmers to create more with fewer resources."[3]

This exemplifies how today's innovations are providing solutions to the increasing challenges of farming and of feeding the world. And, what might surprise you is that although farming is one of the world's oldest industries, farmers are actually among *the earliest adopters* of today's innovations. The next time you fill your plate consider this: It takes everything from AI, robotics, and computer vision to advanced sensing, cloud computing, data analytics, and more to put that food on your table.

Deere Leading the Agtech Revolution

As mentioned in Chapter 1, Deere has been at the forefront of the agtech revolution and has transformed itself into a technology-powered organization bringing game-changing offerings to farmers. Through this mission, Deere is empowering farmers to do more with less so they can put food on an exponentially growing number of plates across the world, both today and for future generations (see Figure 2.1).

As a company nearly 200 years old, Deere has always had innovation in its DNA, from inventing the first steel plow in 1837, and replacing horses with engines by introducing the first two tractors in 1918, to inventing the first all-hydraulic bulldozer in 1958.[5]

Figure 2.1 An example of Deere's use of advanced innovations that help farmers do more with less is its See & Spray™ technology. The technology enables farmers to only spray herbicides on the weeds, which reduces the amount needed by up to 66%. The technology can "recognize the difference between plants even in conditions that would challenge the human eye. See & Spray has 36 cameras . . . [that] scan more than 2,200 square feet of land and capture 1.2 billion pixels per second. If you tried to match that level of sensing and processing with human eyes, it would take nearly 6,000 people."[4]
Source: Copyright © 2024 Deere & Company

In more recent years, Deere has embraced digital innovations as they came to market, developing applications that have literally changed the face of agriculture. For example, in the late 1990s, Deere saw the tremendous opportunity GPS technology could bring to farming and began investing in this technology. The company later integrated GPS into its tractors so they could drive themselves through a field within an inch of accuracy, and then used GPS technology to collect geospatial data on both the inputs farmers used throughout the year and the crops they harvested at the end of the year. GPS technology is now used by farmers in more than 100 countries.[6]

As Deere continued on its mission to transform farming, it used connectivity and the Internet of Things to offer farmers the benefits of cloud computing, giving them access to valuable, real-time information for faster and better decision-making. And in 2022, Deere introduced the first fully autonomous self-driving tractor, which features advanced digital innovations like sensors and computer vision.

Deere is also leveraging AI and computer vision that integrates precision tech and cloud-based data with robotics, as well as computer vision and machine learning. These technologies have enabled Deere to revolutionize the planting process. Advanced sensors and robots place each seed

in the ground at a scale and precision beyond human capacity, helping to optimize growth. Deere's computer vision technology enables farmers to quickly and precisely apply fertilizer so that only the weeds are hit with the pesticide, maximizing crops growing in their land. Today, Deere has more than 500,000 technology-powered connected machines running across more than a third of the earth's land surface.[7] Smarter farming for better yields.

Moreover, the company is doing all of this with sustainability front and center in its mission. Deere's Leap Ambitions effort involves working to reduce carbon emission and resource consumption, recycle machinery and materials, and develop intelligent technology to help customers be more productive and profitable. The company has set goals to reduce its greenhouse gas emissions (direct and indirect) by 50% by the year 2030.[8] Since 2017, the company has reduced operational greenhouse gas emissions by nearly 29%. Deere also surpassed its 2022 renewable electricity goal by achieving nearly 59% renewable electricity.[9] These are just a few examples of the many sustainability efforts underway at Deere.

The result of Deere using tech for good has yielded significant quantifiable impacts. For example, the company's intelligent sprayers have helped farmers reduce herbicide use by approximately two-thirds (depending on crop and field conditions). Another example is Deere's current cloud network, which is comprised of hundreds of thousands of connected machines that provide farmers with critical information at their fingertips for better decision-making.[10]

But this mission has not only been good for farmers and our world. The effort has also had a tremendous impact on Deere's bottom line, with the company's net income growing to more than $10 billion in fiscal year 2023.[11] This is proof that a relentless commitment to use technology to solve a massive problem like helping farmers feed our ever-growing population can marry purpose with profit and make a true difference in our world.

From a marketing perspective, Deere has built an irrefutable reputation and produced stories so strong they have universal appeal to all stakeholders. Deere's long and impressive awards list speaks volumes to this. In 2023 and 2024 alone, Deere was ranked #3 in brand reputation in an Axios/Harris Poll (2023), named among Time's World's Best Companies (2023), received CES Best of Innovation in Robotics (2023), named to Ethisphere Institute's Most Ethical Companies List (2024), ranked #1 in Construction & Farm Machinery by Fortune (2024), and ranked #9 in Newsweek's Excellence 1000 Index (2024).[12]

By transforming farming through today's technology, Deere has also created an entire economy around agtech, paving the way for other