Mike Walsh

THE ALGORITHMIC LEADER

TOMORROW

How to be smart when machines are smarter than you

ADVANCE PRAISE FOR

THE ALGORITHMIC LEADER

"Provocative, powerful, and full of actionable wisdom. *The Algorithmic Leader* is a tour de force of ideas and insights from global pioneers who are challenging the status quo and reinventing organizations. Mike Walsh has produced a must-read for every leader and entrepreneur in this digital age."

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"This book first made me deeply uneasy, and then deeply inspired. Like you, I wrestle with how best to thrive as our world grows increasingly complex and confusing, a world where the simple rules just don't work anymore. Mike Walsh's 10 principles, distilled from real-life experience and deep thinking, point the way forward."

Michael Bungay Stanier, author of the *Wall Street Journal* bestseller *The Coaching Habit*

"Great companies are built on culture. Mike Walsh's prescient vision of the algorithmic company of the future is no robot army of soulless analytics dashboards, but a living, breathing organism—a community of humans who respond to motivation beyond compensation; purpose and impact; decision-making and autonomy; location and collaboration. A worthy read."

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"Mike Walsh provides an interesting and informative look at our future, which will be defined by algorithms and artificial intelligence. The underlying technologies may seem complex, but the message for business leaders is simple: use the new tools to enhance your skills—or become roadkill."

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"Mike Walsh's years of talking to the world's technology leaders have given him unusually deep insight into the ways in which technology will change our world. Now he has written a powerful book that enables the rest of us to gain that insight. This book will change the way you think. Full of rich examples and great quotes, it is like a hyperspeed trip into the future that will give you a whole new perspective on your industry and career."

Melissa Schilling, author of *Quirky* and *Strategic Management of Technological Innovation*

"Mike Walsh's *The Algorithmic Leader* is an intelligent and timely look at leadership in the digital age. If the twentieth century was governed by leaders of people, the twenty-first will be governed by leaders who understand the relationship between people and the technologies that define the modern workplace. Walsh exposes not just opportunities, but also potential pitfalls, ultimately leaving today's leaders smarter and better prepared for the coming rise of algorithms and big data."

Adam Alter, author of the *New York Times* bestseller *Irresistible* and *Drunk Tank Pink*

"I have read many thousands of pages about the impact of algorithms and automation on our lives, and Mike Walsh's *The Algorithmic Leader* stands out from the crowd. It is honest in its complexity, practical in its lessons, and profound in its analysis of the future of work. It's a must-read for anyone contemplating how smart humans can collaborate with smart machines."

David Epstein, author of the *New York Times* bestseller *The Sports Gene* and *Range*

"*The Algorithmic Leader* is brilliant and scary. The scale of change that AI is bringing into our lives can be bewildering. In this timely book, Mike Walsh provides (often counterintuitive) ideas and

fascinating insights into what the coming decades will bring. Read it twice, or to be safe, three times. This is an essential book."

Efe Cakarel, founder & CEO of MUBI

"We are at the dawn of the artificial intelligence era. Mike Walsh offers a succinct guide for leaders to understand the secrets of the new algorithmic age, and how they apply in a disruptive and diverse global context. You cannot grasp the future of AI without considering Asia. Understanding leaders like Jack Ma and Masayoshi Son is as important as learning from Jeff Bezos or Reed Hastings. Whether you are working in San Francisco or Shanghai, *The Algorithmic Leader* is a cognitive tool kit for changing the way we think, how we work, and what it takes to win in an increasingly uncertain future."

Porter Erisman, former Alibaba vice president and author of *Alibaba's World*

"Mike Walsh has always been a fine teller of the future's stories. But this book is different. It offers not just a way of thinking about the future, but also a set of pragmatic and practical frameworks for navigating them. Oh yeah, and the stories are great too."

Genevieve Bell, director of the 3A Institute, Florence Violet McKenzie Chair, distinguished professor at the Australian National University, vice president and senior fellow at Intel Corporation

"If you want to start asking the right questions about the future, then Mike Walsh's new book is the best place to start. In an age of artificial intelligence, we all need to reconsider ideas around privacy, privilege, power, equality, and even truth. *The Algorithmic Leader* provides strategies, frameworks, and importantly, provocations designed to wake us up to the fact that our world may look the same, but all the rules have changed."

Sean Gourley, founder & CEO of Primer

"Mike Walsh is challenging the old models of management. He paints a future for leadership that has a lot more in common with the art of gardening than the art of war. Great gardeners start with a great vision and then focus on creating an ecosystem that understands, nourishes, and tends, allowing all to become their strongest, no matter what uncertainties they face, until they brilliantly fruit and blossom. Walsh's principles tell us how it should be done, but then he passionately shows that it is not the 'how' that matters but the 'why': to make our world a better place for all of humanity to flourish."

Ali Parsa, founder & CEO of Babylon Health

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"A rhizome has no beginning or end; it is always in the middle, between things, interbeing, intermezzo."
GILLES DELEUZE AND FÉLIX GUATTARI

Flying the unfriendly skies

The scene at the boarding gate was nothing out of the ordinary. Anxious parents with young children milled around the front of the lineup, arms overflowing with bags and toys. Behind them, a cluster of first-class travelers tapped impatiently at their phones, while those holding boarding cards with zones 5 or below eyed their carry-on luggage, wondering if they would be forced to check their bags.

Certainly, few of the passengers scheduled to fly on that cloudy, late Sunday afternoon in April would have paid any heed to the automated systems that were already in action as they filtered through security, boarding passes in hand, and made their way to United flight 3411, due to depart Chicago for Louisville at 5:40 p.m.

At around thirty minutes before the scheduled departure time, over the rhythmic beeping of passengers scanning their barcodes, a gate agent announced that the flight had been overbooked and that volunteers were required to give up their seats for United employees who needed to get to Louisville. The agent offered a $400 voucher and an overnight hotel stay in Chicago. Given that the next available flight was not for twenty-one hours, it was not surprising that no one took up the offer.

By now, most of the passengers were on board. With no volunteers, the same request was made over the plane's intercom, this time with a voucher for $800. When no one responded once again, a tense United manager boarded and declared to the passengers that some of them would now be chosen at random to leave the plane.

Of course, there was nothing actually *random* about the process. Passengers were chosen by the airline's computer system, based on a complex set of data and calculations. Four passengers were selected, three of whom grudgingly complied, taking their belongings off the plane. The fourth refused.

At 5:21 p.m., another passenger, Tyler Bridges, posted on Twitter a video that subsequently went viral. The contents were shocking and inexplicable: a passenger with blood running down his face could be seen running up the center aisle of the plane, shouting, "I have to go home! I have to go home!" and then, "Just kill me. Just kill me."

More videos emerged on social media shortly after. In one, police officers appeared to be escorting passengers from the plane. In another, a man was dragged violently out of his seat, onto the floor, and then off the plane by a Chicago Department of Aviation officer, as other passengers screamed in protest. It later emerged that the removed passenger was the fourth passenger, the one who had refused to give up his seat. His name was David Dao, and he lived in Louisville, Kentucky.

Sixty-nine-year-old Dao, a US citizen, was originally from Vietnam. He went to medical school there in the 1970s before moving to the United States after the fall of Saigon. A pulmonary disease specialist, he wanted to stay on the flight because he had patients to see the following morning.

Despite his protests, Dao had been forcibly removed by an airport security team so violently that he suffered a slew of injuries, including a concussion, a broken nose, and the loss of two front teeth. After his removal, a United crew took the newly vacated seats and finally, almost two hours after the scheduled departure time, flight 3411 took off. That was, however, only the beginning of the story.

Later that evening, online interest in the event grew as more people watched and shared the violent scenes of Dao's removal. United Airlines was forced to issue a statement to the media to explain what had happened:

> Flight 3411 from Chicago to Louisville was overbooked. After our team looked for volunteers, one customer refused to leave the aircraft voluntarily, and law enforcement was asked to come to the gate. We apologize for the overbook situation. Further details on the removed customer should be directed to authorities.

Overbooking is one of those evils of modern-day flying that travelers have come to accept. Airlines assume that there will be a certain number of no-shows on any given day. Accordingly, they oversell tickets, knowing that even if everyone turns up, some people with more flexible schedules can be persuaded to accept compensation in return for catching an alternative flight. In this situation, however, no one wanted to give up their seat. And with a flight crew that needed to board, that meant that ticketed and seated passengers had to be removed.

You might think that such a decision was merely the result of poor customer service. United, after all, already had something of a

poor reputation when it came to looking after passengers. Numerous jokes circulated online about the airline breaking guitars, losing luggage, and even killing pets.

But what if flight 3411's problems were not the fault of a gate agent or flight attendant, but rather a very different kind of failure? United was a company driven by rules, with strict operating procedures. And importantly, the execution of those rules and procedures was largely governed by data and algorithms. Few employees at United had the power to deviate from the airline's algorithmic playbook; employees were under pressure to follow, not bend, the rules.

A cascade of algorithms shaped the events of that fateful day. An employee-scheduling algorithm optimized for efficiency determined that crew should be loaded thirty minutes before a flight, even though passengers had already boarded. A yield-management algorithm optimized for profit, which generally controlled the overbooking ratio, had set the maximum compensation allowable for bounced travelers at $800. Finally, a customer-value algorithm, optimized to avoid annoying the highest-spending flyers, was designed to identify budget travelers, who were the least likely to cause problems should they need to be "re-accommodated."

"Re-accommodation," in case you were wondering, is the term that United's CEO, Oscar Munoz, initially used to describe Dao's violent removal from the plane. "This is an upsetting event to all of us here at United," Munoz was quoted as saying. "I apologize for having to re-accommodate these customers."

Munoz had been in the job for about a year and a half before that Sunday's crisis. Charismatic, funny, and well loved by his employees, he had come from humble beginnings: he grew up in Southern California, where his father had been a union meatcutter from Mexico. After working his way up the ranks of companies like PepsiCo and Coca-Cola, he had his real leadership breakthrough as COO of rail operator CSX, where he had artfully steered the railway toward

more profitable product segments and tighter operating efficiency, ultimately resulting in its market capitalization quadrupling over the twelve years he spent in leadership positions there.

When Munoz was offered the job as CEO of United, the airline was in trouble. Not only was the company reeling from a bribery scandal involving public officials, but it was also suffering integration woes as a result of its 2010 merger with Continental. In 2015, United tied with Southwest for the lowest on-time arrival rate. Morale was low, employees were disengaged, and the two hedge funds that were the airline's largest shareholders were demanding changes.

Munoz had seen the dangers of a disengaged workforce and lack of operational discipline firsthand at CSX. He immediately set to work rebuilding trust with employees and implementing tighter controls. A week after accepting the job as CEO, he emailed the company's most frequent flyers, promising, "We can do better." The early response from analysts, the industry, and even the unions was positive.

Then, thirty days later, Munoz had a massive heart attack that nearly killed him. However, he had a heart transplant, which saved his life. His recovering health seemed to take on a life of its own at United, becoming a metaphor for the hopeful rebirth of the company. He had become one of the most respected corporate leaders in the US, and things were looking up for United.

Then David Dao decided to not give up his seat.

It is understandable that Munoz's first response was to defend his team. They had, after all, followed the company playbook to the letter. Shortly after the incident, he sent employees a memo supporting their decisions, while characterizing Dao as "disruptive and belligerent." Only in the face of global outrage would he rapidly shift his position.

And outrage there was. In just under a month, Munoz fell dramatically from grace. He would be forced to issue a series of

progressively more humble apologies, provide testimony to Congress, reach an out-of-court settlement with Dao, and forgo his planned appointment as chairman of the airline. Suddenly, his recent designation as *PR Week*'s Communicator of the Year, awarded to him just a few months earlier, became an ironic reminder of how quickly circumstances could change.

Where did Munoz go wrong? In almost every respect he was the model corporate leader: principled, fair, and admired by his employees. Even his focus on operational discipline at the expense of customer service was not an unreasonable trade-off in an industry driven by small margins and high competition. To understand why Munoz's approach was flawed, you have to look at the problem again, but with a different lens.

Munoz was an ideal leader for an era of maintenance schedules, quarterly budgets, cost reductions, sales quotas, and margin improvements. While those things are certainly important, they are no longer sufficient for survival. They are part of an analogue world of people, assets, and things.

Events used to happen at a relatively more measured and predictable pace. You could invest in products and platforms, and amortize the development costs over long life cycles. Planning departments created detailed budgets, which allowed managers to scrutinize sales performance quarter to quarter, month to month, week to week, item by item.

That's not to say that the job of the leader was more straightforward then. If anything, mature industries exhibit a fierce struggle for market share. This Darwinian environment selects for a particular kind of leader—aggressive, ruthless, with a win-at-all-costs mentality—but the skills formed and valued in one era will not necessarily serve you well in a new one characterized by different rules and dynamics. Munoz ran into trouble when he didn't recognize that the real driver of success or failure for an airline like United, and many other companies, is not its stuff but rather its algorithms.

United didn't have a customer service problem; it had an algorithmic design problem.

You don't have to be working for a technology company for algorithms to matter. Every company today is an algorithmic company, whether it knows it or not. What is a car these days but a software platform on wheels? When the leaders of Volkswagen failed to stop their own engineers from designing software to allow their diesel cars to pass US emissions tests, regulators branded the entire company a criminal enterprise.

There is no escaping algorithms. Information about the world reaches us through data; our decisions and attempts to change the world are expressed in data. Algorithms are not purely abstractions. They are a bridge between computation and real-world challenges. We use them as a tool to address problems in an increasingly complex world.

Algorithms shape the design and delivery of products and services, with profound implications not only for how we work but also for how we solve problems and manage people. They present powerful opportunities for those who know how to work with them. In a way, algorithms are a form of embodied logic, in cases where they are well defined. They allow us to take our knowledge, experience, and insights about the world and build them into platforms that can then act autonomously on our behalf. Some are deterministic, while others may have a random component that increases their efficiency in computing problems.

The drama on flight 3411 could have happened on almost any airline, all of which have similar algorithmic models, or in any number of other industries—from banking to retail, logistics to insurance. And in fact, you will find that algorithms are increasingly at the heart of major scandals and strategic challenges in a wide range of companies. Poor management of customer information and algorithmic security at Experian, Equifax, and Target led to massive data breaches. Facebook's Mark Zuckerberg faced days

of heated interrogation on Capitol Hill for the company's repeated misuse of consumer data and irresponsible attitude toward allowing third parties to manipulate their algorithms. And in February 2018, Uber settled (to the tune of $245 million) with a Google subsidiary, Waymo, when an engineer Uber hired brought over proprietary algorithms, data, and research used for the production of self-driving cars.

Algorithms are here to stay. The secret lies in knowing how to lead companies and organizations that use and depend on them; that's where Munoz fell down. But just how did algorithms become so important to our collective future? And how can someone trained in the analogue era truly rise to become an algorithmic leader?

A tale of two leaders

Just as there is no single path to success, there is also no definitive archetype for what makes for a great algorithmic leader. The aim of this book is to explore the personal qualities, cognitive frameworks, and strategic approaches exhibited by a small but growing group of leaders who seem to thrive in this new environment, which is really about finding your own response to the algorithmic age. As a starting point, I've created this simple definition:

> An algorithmic leader is someone who has successfully adapted their decision making, management style, and creative output to the complexities of the machine age.

To be a successful leader in this new era requires a different approach, a different set of skills, and a different way of thinking. But by now, perhaps a more existential question may be troubling some of you: *Isn't the very idea of a leader in the algorithmic age an antiquated concept?*

If in the future companies are composed of not only people but also algorithmic platforms that are making decisions, monitoring

processes, and managing resources, what exactly will be the role of the leader? Can you be a leader if you aren't making all the important decisions? Can you be a leader without an impressive job title and a team of subordinates? Can you even be a leader without people following you?

We like to tell ourselves stories about leaders. Whether it be classical myths or Hollywood movies, business biographies or news stories, we tend to present leaders as individuals with special qualities who act as heroic agents of change, defending their people against enemies and bringing them safely into a promised land of prosperity.

The problem is, in an algorithmic world, the traditional distinctions—that is, those between competitor and partner, local and global, boss and subordinate, center and edge, customer and product, human and machine—are all blurred. Data and algorithms now connect us in complex, dynamic ways that make a mockery of the neatly arranged models of twentieth-century organizations, industries, and societies.

If the analogue leader thrived by climbing the heights of a hierarchical organization, the algorithmic leader needs to operate in an interconnected totality that is more like an organic ecosystem.

Those of you who are entrepreneurs or freelancers have an advantage: You already understand that being in a small organization means playing multiple roles. You have already mastered the art of orchestrating other suppliers and technologies in order to bring a complex product or service to market, despite your size. When you are small, your value as a leader is defined not by your position in an organizational chart or a title on your business card, but by the map of your connections and relationships.

Leaders in large organizations need to learn this same lesson about how real value is created. Knowledge in a twenty-first-century organization lives everywhere, not just where the corporate phone directory says it belongs. Insight is democratic. The next great idea that will transform your business might be hidden in your server

logs, in field notes written by a maintenance engineer, or buried in your product itself, like the live data from a jet engine operating at 35,000 feet.

Your real power as a leader is reflected not in how many people you have reporting to you, but in how successful you have been in connecting people, partners, and platforms. You add the most value when you grow and feed your organizational network, not when you push your way to the top of the corporate pyramid.

The leader in the rhizome

In the 1970s, two French philosophers, Gilles Deleuze and Félix Guattari, challenged existing philosophical notions of the construct of knowledge, arguing that the traditional Western comparison of knowledge to a tree restricted it to being a series of vertical and linear connections. They noted that the tree model (which they call the arborescent model) had come to dominate Western thought in a plethora of disciplines and areas of study, whether it be linguistics, psychoanalysis, logic, biology, or human organization. In essence, the tree model means we approach knowledge as a hierarchical system, with knowledge growing from roots, just as a tree does.

Deleuze and Guattari found that model of describing the world inadequate to explain the multiplicity of human society and culture. In their view, there was a more appropriate metaphor from the natural world: the rhizome.

A rhizome is the tangled mass of roots of plants like bamboo, lotus, or ginger. Rhizomes are stems that run underground, striking new roots out of their nodes, down into the soil. They can also shoot new stems up to the surface. The rhizome is a complex network used not only for reproduction, but also for storing nutrients and energy for all new plants that are propagated from it. If you have ever tried to rid your garden of an invasive species like poison

ivy or nettle, you have experienced the irrepressible power of a rhizome. Even a small piece left in the soil after you have dug out a weed will be enough for a new plant to emerge.

Whereas a tree has only one trunk and one entry point, a rhizome has lateral shoots and probing roots, and hence multiple entryways. A rhizome has ceaseless connections; there is no beginning or end. And in this way, Deleuze and Guattari argue that the rhizome helps us see that history and culture create a complex map with a wide array of influences of no specific origin or genesis.

The rhizome is also a useful way of thinking about leadership in an algorithmic age.

If the analogue leader was a rigid tree—supported by a root system of administrative processes, with subordinates as branches stemming from them—then the algorithmic leader is something very different indeed. Like a rhizome, algorithmic leaders have to thrive without clearly defined hierarchies or structures. You need to be a connector, not a controller. You are an integral part of a root system that has no center or edge and that relies on you to feed it nutrients and expand its connections. Just as no single shoot of bamboo is in charge of the forest, neither are you solely responsible for the fate of your team or organization. But that doesn't mean you can't be influential, powerful, or even as pervasive and resilient as a weed.

The rhizome is a reminder that in an age where machine intelligence is able to continuously weave meaningful connections between data, we must challenge all of our traditional notions about structure, hierarchy, and order.

Being an algorithmic leader means more than just being able to share a few rehearsed anecdotes about artificial intelligence and big data. It means learning to tamp down your own ego, willingly tearing down the corporate structures that support your status, letting go of the idea that you need to make all the decisions, letting your teams self-organize and self-manage, not worrying about being seen to be

right all the time, being open to more open forms of partnerships and work arrangements, and embracing a new, uncertain future.

As I've watched the rise of Netflix in recent years, and the way it has transformed global TV-watching habits, I have often wondered how an old-school media mogul like Rupert Murdoch, John Malone, or Ted Turner might have run that business. What made the CEO of Netflix, Reed Hastings, so effective? How was he able to achieve such rapid global growth at Netflix while navigating difficult transitions, such as when the company switched from sending physical DVDs in the mail to embracing broadband streaming? Is Netflix successful because it runs on algorithms, or because it is run by algorithmic leaders?

I had an interesting insight into that question when I met Andy Harries, the CEO and co-founder of Left Bank Pictures. Harries is one of the world's top drama creators, including *Cold Feet*, *Prime Suspect*, *Wallander*, *Outlander*, and *The Queen*, which saw Helen Mirren win, among other awards, an Oscar for Best Performance by an Actress in a Leading Role.

Harries wanted to pitch a TV show about the British royal family, based on themes explored in *The Queen*. He met with all the major US TV networks, who liked the idea but, after lots of consideration and debate, couldn't commit to moving forward. Finally, Harries decided to meet with Reed Hastings and Netflix's chief content officer, Ted Sarandos.

It was the strangest meeting, Harries explained, as he handed me a cup of a coffee at his office in London. As soon as he walked into the conference room with Hastings and Sarandos, and before he had a chance to pitch the show, they told him that they were ready to move ahead. And not just with a pilot, but with a full season.

Unlike the other networks, the team at Netflix had already analyzed their audience data and had used algorithms to predict the show's likely performance. They knew their audience and precisely the kinds of shows that would work. Furthermore, with an

upcoming launch in the UK market, they believed that the proposed show would be a hit. And they were right. *The Crown*'s third season is now in production, and it has twice been nominated for an Emmy for Outstanding Drama Series.

Algorithmic leaders reveal themselves in the way they make decisions and solve problems. How Reed Hastings and his team think about content, its relationship to their audience and their platform, and even how it should be presented and released is radically different from the way traditional leaders in media companies act and behave.

When you are capable of knowing precisely what any of your millions of global customers are doing or desiring at any point in time, how can you not see the world differently? How can you not seek to leverage machine learning, algorithms, and automation to fulfill those needs in a highly personalized way?

Leaders like Hastings didn't always have that kind of perspective. Most of us who are currently in leadership positions started out as analogue leaders. We need to make a conscious decision to adapt and evolve and to recognize that the availability of data and algorithms should change our viewpoint.

The end of all jobs?

This book is about how algorithms, AI, and automation will change the world of work, including your job as a leader. There are some, however, who take a much darker view and believe that the machine age will radically eliminate work itself. Let's address that now.

When I finished high school, I chose to pursue two degrees: accounting and law. But after spending a couple of months during my summer vacation stuck in a basement combing through records for an insurance audit, I knew that accounting was not for me. That left the legal profession.

Law firms are conservative places: heavy furniture, wood paneling, portraits of the founding partners, and lots of leather-bound books. On my first day as a graduate, I pulled on my brand new suit, which was deeply uncomfortable and fit terribly, and tried to put on a brave face as I joined the other new recruits waiting in the conference room. When it came time to meet the managing partner, he fixed me with a grim look. He had a tall stack of legal briefs in front of him: curling papers, bulldog clips, and beige manila folders.

"Ah, the new associate . . ." He smiled, with the charm of an apex predator. "Do you see all these documents?" He gestured at the pile. "We need you to check them all for spelling by the morning."

"Spelling?" I croaked, looking at the pile with horror, wondering why I had spent five years in law school.

"Yes," he replied, "the lawyers around here are useless. Their briefs are full of errors. Your job is to find them."

"Don't you have any software for that?" I asked, the prospect of years of menial labor now stretching ahead of me.

"Yes, actually, we do." He sighed, dismissing me with his hand. "That's you."

Suffice to say, I didn't last long. When I quit the internship and the legal profession as a whole, I found myself thinking, "If these lawyers can't even use basic technology, what hope is there for them?" Probably, I surmised, most of them would end up being replaced by software. After all, it seemed that a lot of legal work could be done by using better templates, expert systems, and document analysis software.

I cringe now to think of my naivety. That was over twenty years ago. Not only has technology not replaced the legal profession, but there are more lawyers now than at any time in history (a terrifying thought!). How could I have got it so wrong?

I believe that the mistake I made then is one that many are making now. People who argue that robots will take away all our jobs assume that there is a simple relationship between automation and employment. They believe that just because you can automate part

of a job, the entire job will be automated at some point. But sometimes technology has the effect of *changing* jobs rather than cutting them. As we will examine later in this book, the ATM didn't mean the end of the bank teller. The number of bank tellers eventually increased, as it became cheaper to open up bank branches. The real impact of automation was to change the job of the bank teller from counting money to building relationships.

Back to our legal friends. A little while ago, eDiscovery software started to catch on. This software does a lot that a junior legal associate might do in a court case: reading through documents, compiling lists, organizing materials. It is much less expensive to use eDiscovery than a human to do that work, which means that judges started allowing it more often, which then generated more work for lawyers. In other words, automating part of a lawyer's job led to greater access to legal services and a corresponding increase in demand for lawyers.

But while algorithms might not necessarily replace the need for human beings, they do increase the responsibility placed on us. Think back to the experience of Oscar Munoz and his disastrous response to what happened on flight 3411: An algorithm cannot be a stand-in for true leadership. We still need real-life humans who can interpret what the machines are telling us, who can decide whether those conclusions are appropriate and ethical, and who know how to best orchestrate the capabilities of machines that are smarter than us.

Unlike a human being, an algorithm will come to the same conclusions every single time, whether it is Monday morning or Friday afternoon, cold or hot, or after the algorithm has handled thousands of similar cases. However, that doesn't make algorithms impartial judges. Quite the contrary.

Algorithms are trained on data that is collected by and about humans. We choose where the data comes from, what success criteria are used, or what truth looks like, and in doing so, we embed them with all our views, prejudices, and biases. They are ultimately

an expression of us and our world. While we may end up making fewer decisions in the future, leaders will need to spend more time designing, refining, and validating the algorithms that will make those decisions instead.

Anyone can be an algorithmic leader, even people who don't work in what we might think of as a large, algorithmic organization like Amazon, Google, or Facebook. That is because big or small, traditional or technological, algorithms and data are changing every kind of business.

Whether you run a big factory making automotive parts in China or a small dry cleaner in Brooklyn, your success hangs on more than how well you manage your staff, customers, or suppliers. In fact, your future is more likely to depend on how well you leverage all the data and information generated by your activities rather than how well you manage the typical levers of your business.

Let's consider those two cases: one big, one small. If you are an automotive manufacturer, your physical factory has a digital footprint. The performance of your machines, the configuration of your production lines, the design of your workflows and processes can all be expressed as data that can be read, managed, and optimized by algorithms. It can even be copied and transplanted as a template to somewhere else entirely. That means a digital facility designed in Shenzhen, China, can be replicated in Warsaw, Poland. In other words, the most important part of your factory is the data about your factory.

Similarly, even if you run a small dry cleaning business, your engagement with customers, your accounting systems, your energy and chemical consumption, your scheduling of part-time staff all generate a digital footprint, which in the near future might be optimized, for a monthly subscription cost, by cloud-based software that uses machine learning and AI. You will still work in a physical store, but many of your decisions, customer interactions, and daily activities will be driven by code.

The future of companies, regardless of size, will be shaped by algorithms. It is already happening today. Think about it. What processes based on algorithms are currently in place in your organization? (Are your customers, partners, or employees even aware of the automated systems that shape their lives, decisions, and experiences?)

Not every business will have the resources to create its own machine learning team, design its own algorithms, or disrupt its entire industry. However, none of those things are necessary in order for you to become a more effective leader, capable of weathering the uncertainties of the twenty-first century. As a starting point, it is helpful to realize that you are not actually fighting the machines for survival. Not yet, anyway.

We have a bad habit of fighting the future. Whether it be John Henry in a race with a steam-powered rock-drilling machine, chess champion Garry Kasparov against IBM's Big Blue, or Lee Sedol, the world's best Go player, against Google's AlphaGo AI, we love the idea of pitting ourselves against our own innovations. But when a human loses against a machine, is not the real winner the humans who built the machine? For leaders, the real question is not how smart machines can be, but rather *What does "smart" now mean when it comes to humans?*

Surviving the algorithmic age doesn't require you to *be smarter than* machines. You just need to know what it takes to *be smart*.

Being smart is about knowing the right way to do things; avoiding unnecessary steps; not wasting time or resources; and being open to new approaches and fresh ideas. It is not about blindly following trends. It is about knowing how to take advantage of the latest thinking and applying it effectively to practical problems. Being smart today is different than it was fifty—or even five—years ago.

Being smart when machines are smarter than you requires you to become something new.

How to read this book

This book is based on 10 principles that I've organized into three stages of a journey of transformation, starting with your own mindset, then extending to the people with whom you work, and finally expanding to the world around you:

I Change Your Mind
II Change Your Work
III Change the World

A word of warning. The principles in this book are neither exhaustive nor definitive; they are intended as a guide for personal exploration. I chose them based on numerous conversations with visionary leaders and global innovators, a decade of advisory and consulting work, and a detailed study of scenarios where algorithmic-era leaders typically act and think differently from analogue-era leaders. So, while you can certainly read the table of contents as a series of recommendations, what I'm really trying to offer you is not a checklist but a practical framework for thinking about problems and decisions in a new way.

The 10 principles are:

1 Work backward from the future
2 Aim for 10×, not 10%
3 Think computationally
4 Embrace uncertainty
5 Make culture your operating system
6 Don't work, design work
7 Automate and elevate
8 If the answer is X, ask Y
9 When in doubt, ask a human
10 Solve for purpose, not just profit

Read this book from start to finish, or skip around and focus on the principles that interest you most. In the real world, ideas have to speak to difficult choices that leaders face when they make decisions, allocate resources, or bet on a new venture. So, as you read, try to apply the principles to your current challenges and opportunities.

At the end of each chapter, I've included a short summary and a question designed to challenge you to confront the core of what needs to change in your own organization. It is all too easy to read about disruption without accepting the terrifying possibility that the real thing that needs to change isn't your company or industry—it's you.