CHAPTER ONE

Introduction

THE INNOVATION TRAP

Imagine you're driving down a wintery road, sheltered from the elements in your sleek, new car. Outside the snow makes the roads slick and the temperature arctic, but inside an array of heaters, massagers, and air fragrance systems keep you insulated from the elements. But then, all of a sudden, your visibility starts to fade, and the windshield quickly fogs up. For generations, car owners would have solved the problem with a simple turn of the knob or push of the button. Muscle memory would have guided your hand to the right place without even taking your eyes off the road. But now cars have gotten too innovative.[1] Scrolling through pages of options on the cutting-edge touchscreen control, you search in a panic as the visibility drops, taking your eyes off the cars in front of you in the process. We're constantly told that technological innovation is the road to a better future. But all too often, the sudden changes it brings about are a figurative (or even literal) car wreck.[2]

Or a submarine disaster – like the Titan, the carbon fiber death trap whose makers proudly declared, "innovation is outside of an already accepted system."[3] The predicable calamity came in the summer of 2023 when OceanGate's Titan submersible imploded, killing four people, including Stockton Rush, the company's CEO, while traveling to see the fabled wreckage of the Titanic. In the aftermath, Karl Stanley, one of Rush's friends, described the vessel as a "mousetrap for billionaires" that was destined for tragedy.[4] One didn't need to wait until after the disaster to see the dangers. Rush had been warned that his disruption would be deadly long before the cut-rate craft made its first trip to the Titanic.[5] Unfortunately, far too often, warnings like these go unheeded.

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Many of us were taught Aesop's fable of the tortoise and the hare, but far fewer of us truly learned the lesson, especially when it comes to technology. The speedy hare zips off, but it is so overconfident that it loses focus and takes a nap. When the smugly sleeping sprinter wakes up, the tenacious tortoise has won the race. The moral is so simple we teach it to toddlers. Yet the message continues to elude so many of those who hold power in the United States. CEOs, politicians, celebrities, seasoned and burgeoning entrepreneurs, and even non-profit leaders all wax poetically about speedy, hare-like innovations. Indeed, as we're writing this chapter and Donald Trump is about to start his second term as president, Elon Musk is urging Republicans to wage a "war on bureaucracy" by embracing the disruptive entrepreneur's approach to politics.[6]

While innovation has many upsides, it has also played a crucial role in transforming the United States into a "risk society."[7] The lessons we draw from our country's misadventures are instructive for those wrestling with technology around the world. Although the United States is a relatively young country, it's a global superpower, and the technologies it develops, the norms it cultivates, and the risks it generates have far-reaching impacts. Like many countries, the United States' dwindling social safety net increasingly leaves individuals stuck fending this risk for themselves.

UPGRADES: A BETTER PATH TO CHANGE

Crucially, not every form of innovation drives these risks. Innovation comes in many flavors, more than an ice cream shop's worth. Gradual innovation, or what we are calling "*upgrades*," is like incrementally improving water quality through decades of environmental regulation. In contrast, discontinuous innovation is like trying to clean up a lake by adding a new, invasive species. When we are being critical of innovation in this book, we are talking about the kind that is disruptive (fractures the status quo) and discontinuous (happens abruptly at once). As a shorthand, we'll frequently refer to it simply as "innovation."

To make our case, we will consider many aspects of technology, but also look beyond its technical dimensions to examine the language, values, ideologies, and practices surrounding it – what innovation scholars Lee Vinsel and Andrew L. Russell call "innovation-speak."[8] Venture capitalists and Big Tech use innovation-speak to channel our desires and drive the

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fear of missing out, painting a utopian picture of tomorrow while downplaying how their innovations have failed in the past. While their sales pitch has been seductive, it is thankfully possible to see through the false promises. Our main goal in this book is to give you the critical thinking skills needed to spot the recurring patterns fueling tech and innovation hype – skills that can help you avoid being misled and better approach many pressing problems. We are inviting you to embrace the upgrade mentality and accept its underlying ethos, which promotes the virtues of incrementalism.[9]

Of course, we're not the first to critique the American obsession with innovation, pushing back against grand-gesture technological utopians who believe that harnessing paradigm-shifting technology is the key to social progress. But existing critiques of innovation tend to fall short. They mostly finger-wave without providing alternatives, identify neglected and ailing infrastructure without offering a new way forward beyond maintenance, provide short-term-oriented options for tweaking the status quo, or offer unrealistic proposals for tearing down longstanding institutions as the predicate to progress. By contrast, upgrades allow us to build an evidence-based, sustainable pathway to progress that addresses our society's most intractable issues.

In *Move Slow and Upgrade*, we'll explain how upgrades often get you where you need to be quicker than if you aim for fast and radical innovations. The key difference between innovation and upgrades might be surprising. It's a realistic type of hope. Innovations are adopted in the hope that untested, unproven changes will provide outsized returns. By contrast, upgrades seek a more reliable return, one that's proportional to the investment. Innovations are driven by best-case scenarios, with advocates often oversimplifying complex situations while downplaying or ignoring a range of risks, including unknown and unquantifiable ones. Alternatively, upgrades are guided by the median case, taking into account more realistic considerations of the costs and benefits of change. With upgrades, therefore, you often know what you'll get. Innovations are when we use a dollar to buy a lottery ticket; upgrades are when we put a dollar in the bank. If Americans turn their backs on the lottery of breakthrough innovation, it may feel deflating, losing the promise of quick fixes and instantaneous success. But by focusing our companies, governments, and communities on upgrading our future, we can make

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better investments. Turning to key case studies of innovation failure and upgrade success, we can bring an alternative narrative into the foreground, turning the tide on decades of innovation obsession.

INNOVATION HOPE AND HYPE

Unfortunately, too often, our hopes and dreams are being placed on innovation – revolutionary products we're told will help society blaze ahead. Tech executives treat ChatGPT and other AI tools like magic, saying they'll not just help do our work, but make human beings ourselves smarter and healthier. And yet the technology also threatens to inundate the public with algorithmically generated disinformation. Voters will struggle to understand what news stories are real, just as teachers will fight to tell which essays are written by a human student. And like so many innovations before it, the flurry of activity surrounding ChatGPT gets problem-solving backward. Instead of investing in technology to tackle the things that matter most to us, we're being told that the problems ChatGPT "solves" should be prioritized. If you had asked the public a few years ago what issues were most pressing for all of us, few would have answered that it took human beings too long to write content. But now we're being sold on the idea that accelerated content creation is the best path to a better world.

Unfortunately, it seems we're still stuck in a vision of social progress expressed in Mark Zuckerberg's infamous mantra, "move fast and break things." Tech CEOs yearn for a revolutionary product that will change how we live and work, just like Mark Zuckerberg, Jeff Bezos, Steve Jobs, Larry Page, and Sergey Brin did. Policymakers hope transformative innovation will drive economic growth and help us do everything from avoiding global warming to achieving widespread flourishing. Individuals chase the innovation dream because that's what they're taught from early on. What's the best way to get rich and change the world? Create the killer app! When history books compress timelines to provide the big picture, they often teach students that innovation drives history and that innovators are historic figures. Indeed, teachers have long been given material that describes US history as a triumph of the pioneering ethos – a tenacious willingness to explore new places and try new things. As a result, they emphasize a continuity between the frontier days, when

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covered wagons crossed the prairies, and the present, where startups strive to make their mark. Anchored in this through line, America is characterized as fundamentally an enterprising country where people work hard, take risks, and push past setbacks. We've reached a point where, in certain parts of the country, teachers could be fired for pointing out how this narrative ignores the human cost borne by indigenous and enslaved peoples. Such a perspective, we're told, threatens America's unparalleled greatness.

The media – legacy and newer forms – routinely amplifies the same bias of celebrating, if not worshipping innovation, while propping up the fairy tale of instantaneous transformation. Disruption is a better, in the sense of being more sensational, story to cover than incremental change because it's more dramatic and exciting than the essential-but-more-ordinary upgrade work that's easy to take for granted. Jeff Bezos is so famous that he's a household name. But how much do you really know about the daily jobs performed by your friends and family who are scientists and engineers? How much do you even want to know?

We're living in a deeply fearful time, and fear is a powerful driver of the innovation trap. In the United States and elsewhere, many are profoundly anxious about pressing social problems, from crime to the economy and global warming. Such fear goes hand-in-hand with skepticism. Americans have become deeply skeptical about our ability to put aside partisanship, tribalism, and short-term interests to work together to promote the common good. With distrust of politicians, experts, and institutions rampant, imaginations have atrophied, and a great deal of hope rests on technology saving us.

We understand why people see things this way. Some progress will indeed require great creative leaps forward. Not only do we need bold visionaries with brave proposals, but it would be hyperbole to say innovation must always lead to more harm than good. For example, as we'll discuss in our chapter on the Covid-19 pandemic, it's better to live in world where novel vaccines offer some protection from dangerous viruses than to not have the option of vaccination at all.

But the thing is, society needs both disruptive innovation and incremental upgrades to be wisely developed and used appropriately. Wisdom requires admitting that innovation's shortcomings have not been widely enough acknowledged, and a combination of arrogance and ignorance

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has led to tremendous overinvestment in it. The desire for techno-fixes – a yearning to fix social problems by creating the right gadget or algorithm that can bypass socially contentious issues and reduce our maladies to engineering problems – left an indelible imprint on the American psyche even though it was popularized during the 1960s (a golden age of optimism about technology's promise), though it has a long history of pushback, and though technology critics have become increasingly vocal of their shortcomings.[10]

Technologies, whether artificial intelligence, quantum computing, or the next big thing, don't exist in a vacuum. They're deeply intertwined with the society that creates and uses them, which is why scholars who critically study technology embrace the concept "sociotechnical systems."[11] When we uncritically cheer for the next high-tech savior as a cure-all, we miss the forest for the trees – the intricate, interconnected web of social and technical factors that shape us and our world. While high-tech tools can have great potential, they will never be magic wands that make inequalities disappear or conjure widespread prosperity. How technologies are created and deployed depends on social, political, economic, and institutional factors. In our market-driven society where an increasing amount of responsibility for the public good involves the private sector, the products that tech giants describe as solutions too often are unconstrained – due, in no small part, to their intense lobbying – by strong regulations. Consequently, they're often only well-suited to maximize shareholder wealth, reinforce privilege, and benefit the powerful without coming close to leveling the playing field or avoiding disproportionately harming the most vulnerable among us. The irony is that while today's tech industry often blames the government for being inefficient (Musk has even successfully lobbied to co-lead a new Department of Government Efficiency) and portrays the private sector as the key to our salvation, the current state of technology owes a tremendous debt to the government for investing so much in scientific research and development in the past.[12]

Consider the internet. It may be a case of the innovation mentality doing more harm than good. "Move fast and break things" has become a widely shared mantra for conducting massive social experiments with the newest devices and services, while leaving others like civil rights organizations, like the one founded and run by one of us, to deal

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with the nightmare results of shattering longstanding norms. If you want to break things quickly, it might mean you think that caring about social and institutional goods that have been built up slowly, often with a lot of care and thought, is something that only small-minded people do. It's also a way to say that those who care about justice and want to hear from a wide range of people, especially the disadvantaged, before shaking things up with technology are too cautious. And it's a way to flatter the excessively bold and overly brash – telling them their ambition of destroying all traces of tradition is noble, not arrogant.

At the center of it all are the venture capitalists who are funding innovation because they're looking for the biggest possible return on their investment, not lasting social change. When executives craft pitch decks, they're thinking of the next funding round, not the foreseeable social effects. They are someone else's problem – externalities others will have to pay for. Tragically, even compliance teams can contribute to the problem by focusing on weak checklist measures rather than efforts that can truly limit social harm.

While it is tempting to wave fingers at others, there is more than enough blame to go around. Frankly, the public shares some of the responsibility. Sure, there are skeptics, there has been a techlash (which includes bipartisan distrust of Big Tech), and there is plenty of ambivalence (a love-hate relationship with devices like mobile phones).[13] But, in the end, rather than meaningfully pushing back against overstatements and outlandish promises about what tech can do, most of us remain all too willing to initially suspend our disbelief. Again and again, convenience trumps conviction. And when the promises fail, the mumbling, groaning, and Congressional hearings don't do much. Apart from outright acts of blatant fraud, there rarely are real consequences for those who gave us false hope in the beginning. And so, the interconnected factors that give rise to this situation have created endless incentives to keep gambling on the next unproven technology and the one after that. Private equity's casino mentality permeates the public sphere.

And this brings us back to the problem of fear – more specifically, the issue of what we should be afraid of. While being too timid and overly cautious gives fear too much power, it's no coincidence that the disruptive spirit of moving fast and breaking things has proven conducive to causing large-scale harm. It's caused accidents, incentivized companies to roll out

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defective products, shattered stable and dependable norms, strained slow-moving regulation, and overwhelmed the public. These days, there's great concern that privacy is dead and democracy is dying – all thanks to tech companies changing things too dramatically, too quickly. Since upgrades pose less risk, create less uncertainty, and are easier to control, they give us less to be afraid of.

Since each and every one of us is impacted by the innovation debate and the ways that it reshapes public infrastructure, it's crucial that this book is accessible far outside the walls of academia. For years, as aspects of innovation theory have been debated in the scholarly literature, innovation practices have accelerated ahead, with the public paying the price for each new misguided innovation. Rather than rooting this book in obscure theoretical debates or ephemeral definitional questions, we focus on case studies that can help any reader start to re-examine the forces that truly shape our society. You may not walk away from these case studies with a doctorate in upgrading, but you'll begin to see how to avoid falling for the same innovation promises that have misled so many, so often. The insights that you'll develop here should help you see things more clearly and make better decisions, and not just right now. You'll be better prepared to deal with new technologies and new ways of using current ones.

INNOVATION FAILS: UPGRADES PREVAIL

To show how upgrading is a risk-informed route forward to a better future, we – a Philosophy Professor and lawyer who founded and is the Executive Director of the non-profit organization Surveillance Technology Oversight Project (S.T.O.P.) – proceed as follows.

Chapter 2, "Zuckerberg's Mythological Metaverse," shows how when the emperor of innovation isn't wearing any clothes, upgraders can still see the naked truth of the situation. Zuckerberg promised a metaverse, a new digital reality, that would transform human connection, interaction, and commerce. But this handwavy conception of the future lacked any clear vision, let alone consumer demand. Upgraders were able to spot the folly long before it became one of the largest corporate boondoggles in modern commerce, a shorthand for corporate disfunction. In contrast to the unbridled enthusiasm of innovators, upgraders would have started

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with the question of why the public would ever want this product in the first place. Instead, Meta tried to sway public opinion with overly rosy futuristic promises, trying to move the market to meet their innovation, rather than solving problems that actually mattered to the public. Like other innovations, the metaverse shows how tech companies ignore the fundamentals of human behavior and social change, dooming their grand visions.

In Chapter 3, "The Crypto Con," we dive deep into the beating heart of cryptocurrency, the paradoxical technology that has made early adherents billions, while adding nothing of real value to society. By any measure, crypto has failed at its stated goal: creating a better financial system. Looking to Bitcoin, we show how the core innovation – a distributed encrypted database – makes a terrible payment system, with slow, expensive, uncorrectable transactions. But crypto enthusiasts ignore more than a decade of failure, doubling down on grandiose claims about solving everything from financial inclusion to corporate governance while ignoring the far easier, low-tech solutions to these very real needs. We include an interview with an early supporter of the massive cryptocurrency Ethereum, who came to see how crypto became "just a tool for the wealthy to become wealthier" rather than fulfilling its promise of financial inclusion for the world's 1.7 billion unbanked people.

Innovations not only fail to solve crucial problems: sometimes they are the problem itself. In Chapter 4, "Home Security Upgrades," we explain why Ring doorbell exemplify the threat of home surveillance innovation. The billion-dollar Amazon subsidiary sold millions of Americans on the promise of security via surveillance without any credible evidence that its system works. But rather than encouraging people to adopt proven security upgrades, such as better locks and secure package drops, Ring wins customers by making its digital innovation seem essential amid a climate of rising fear. By fighting against boring yet effective alternatives, Ring's anxiety-inducing features have further normalized intensive networked surveillance and helped turn innocuous neighborly interactions into potential threats.

Chapter 5, "The Failed Promise of Covid Innovation," presents the pandemic as a crucial case study of how innovative thinking let us down at a time of great vulnerability. Simply put, the early days of massive fatalities made Covid-19 a health crisis. But those days also can be seen as

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a powerful lens for understanding high-tech failure. From contact tracing apps to thermal imaging cameras and digital vaccine passports, there was a fever pitch of government and corporate enthusiasm for innovative solutionism that was predestined to be unreliable and, thus, in context, dangerous. While we acknowledge remarkable breakthroughs like the rapid development of mRNA vaccines, we also make the case that additional effective responses could have come from upgrading existing systems rather than trying to do things entirely new.

Chapter 6, "Moving Fast and Breaking Schools with Remote Proctoring," looks at the failures of educational innovation during the Covid-19 crisis. As schools scrambled to adapt to remote learning, remote proctoring technologies rapidly expanded. They implemented surveillance systems that violated student privacy and disproportionately harmed vulnerable students. Despite claims of maintaining academic integrity, remote proctoring created a stressful, punitive environment that prioritized monitoring over genuine educational support while failing to do nearly enough to address the inequalities at the heart of accessing and using digital resources. Sadly, the rush to innovate missed crucial opportunities to upgrade core educational infrastructure and truly support students during a time of unprecedented challenge. As if this wasn't bad enough, some schools continue to use remote proctoring software. A pandemic problem has thus become the new normal.

In Chapter 7, "Upgrades in the Age of Generative AI," we consider the hype around generative AI tools, like ChatGPT, and explain how the razzle-dazzle has captured the public's imagination, even as the technology hasn't come close to being artificial general intelligence – the goal companies like OpenAI aspire for. While tech giants race to develop generative AI products, we emphasize that they currently are sophisticated pattern-matching systems that simulate intelligence without truly understanding it. Analyzing both negative (political campaigns) and positive (the possibility of helping doctors communicate more empathetically over patient portals) examples, we offer recommendations for spotting uses of generative AI to avoid and how technological upgrades can be carefully and ethically integrated into communication systems to improve human welfare.

Chapter 8, "Upgrading Hiring," explains why there has been so much enthusiasm for integrating AI into multiple dimensions of the hiring

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process, from resume screening to interview bots, despite these endeavors being marred by fundamental flaws, including, in some cases, integrating bias, unreliable pseudoscientific methods, and dehumanizing interactions. In addition to analyzing the incentives that have motivated companies to use flawed, innovative tools, we provide a road map for how to develop and use responsible AI upgrades in the hiring.

In Chapter 9, "Cybersecurity: The Land of the True Upgraders," we argue that cybersecurity professionals embody the ideal of the careful, systematic upgrading that *Move Slow and Upgrade* has been advocating for. Unlike the flashy innovations that we've criticized in earlier chapters, cybersecurity professionals focus on making small, proven improvements through such practices as privacy by design and zero-trust architecture. Recognizing that no single change can solve complex problems, they layer multiple safeguards while acknowledging that human behavior – from falling for scams to knowingly taking risks – is often the main vulnerability. By discussing how cybersecurity teams do quality work, we aim to offer important lessons about how other industries might benefit from adopting an upgrading mindset.

In Chapter 10, "The Upgrader's Mindset," we conclude with an overview of the broader themes seen throughout this work, showcasing the tell-tale signs of innovation failure. These patterns go to the core of our work, lessons learned from past innovations that can help us to avoid repeating similar mistakes in the future. No one, not even the cagiest upgrader, is going to be able to predict every new technology that will succeed or flop. But with this mindset, you can avoid some of the more obvious traps that investors, politicians, and the public continue to fall for, while valuing the evidence-based alternatives we so often neglect.

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