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ZERO

TO

ONE

NOTES ON STARTUPS, OR

HOW TO BUILD THE FUTURE

Peter Thiel

with BLAKE MASTERS

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NEW YORK

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Preface

ZERO TO ONE

EVERY MOMENT IN BUSINESS happens only once. The next Bill Gates will not build an operating system. The next Larry Page or Sergey Brin won't make a search engine. And the next Mark Zuckerberg won't create a social network. If you are copying these guys, you aren't learning from them.

Of course, it's easier to copy a model than to make something new. Doing what we already know how to do takes the world from 1 to n , adding more of something familiar. But every time we create something new, we go from 0 to 1. The act of creation is singular, as is the moment of creation, and the result is something fresh and strange.

Unless they invest in the difficult task of creating new things, American companies will fail in the future no matter how big their profits remain today. What happens when we've gained everything to be had from fine-tuning the old lines of business that we've inherited? Unlikely as it sounds, the answer threatens to be far worse than the crisis of 2008. Today's "best practices" lead to dead ends; the best paths are new and untried.

In a world of gigantic administrative bureaucracies both public and private, searching for a new path might seem like hoping for a miracle. Actually, if American business is going to succeed, we are going to need hundreds, or even thousands, of miracles. This would be depressing but for one crucial fact: humans are distinguished from other species by our ability to work miracles. We call these miracles *technology*.

Technology is miraculous because it allows us to do *more with less*, ratcheting up our fundamental capabilities to a higher level. Other animals are instinctively driven to build things like dams or honeycombs, but we are the only ones that can invent new things and better ways of making them.

Humans don't decide what to build by making choices from some cosmic catalog of options given in advance; instead, by creating new technologies, we rewrite the plan of the world. These are the kind of elementary truths we teach to second graders, but they are easy to forget in a world where so much of what we do is repeat what has been done before.

Zero to One is about how to build companies that create new things. It draws on everything I've learned directly as a co-founder of PayPal and Palantir and then an investor in hundreds of startups, including Facebook and SpaceX. But while I have noticed many patterns, and I relate them here, this book offers no formula for success. The paradox of teaching entrepreneurship is that such a formula necessarily cannot exist; because every innovation is new and unique, no authority can prescribe in concrete terms how to be innovative. Indeed, the single most powerful pattern I have noticed is that successful people find value in unexpected places, and they do this by thinking about business from first principles instead of formulas.

This book stems from a course about startups that I taught at Stanford in 2012. College students can become extremely skilled at a few specialties, but many never learn what to do with those skills in the wider world. My primary goal in teaching the class was to help my students see beyond the tracks laid down by academic specialties to the broader future that is theirs to create. One of those students, Blake Masters, took detailed class notes, which circulated far beyond the campus, and in *Zero to One* I have worked with him to revise the notes for a wider audience. There's no reason why the future should happen only at Stanford, or in college, or in Silicon Valley.

THE CHALLENGE OF THE FUTURE

WHenever I interview someone for a job, I like to ask this question: “What important truth do very few people agree with you on?”

This question sounds easy because it’s straightforward. Actually, it’s very hard to answer. It’s intellectually difficult because the knowledge that everyone is taught in school is by definition agreed upon. And it’s psychologically difficult because anyone trying to answer must say something she knows to be unpopular. Brilliant thinking is rare, but courage is in even shorter supply than genius.

Most commonly, I hear answers like the following:

“Our educational system is broken and urgently needs to be fixed.”

“America is exceptional.”

“There is no God.”

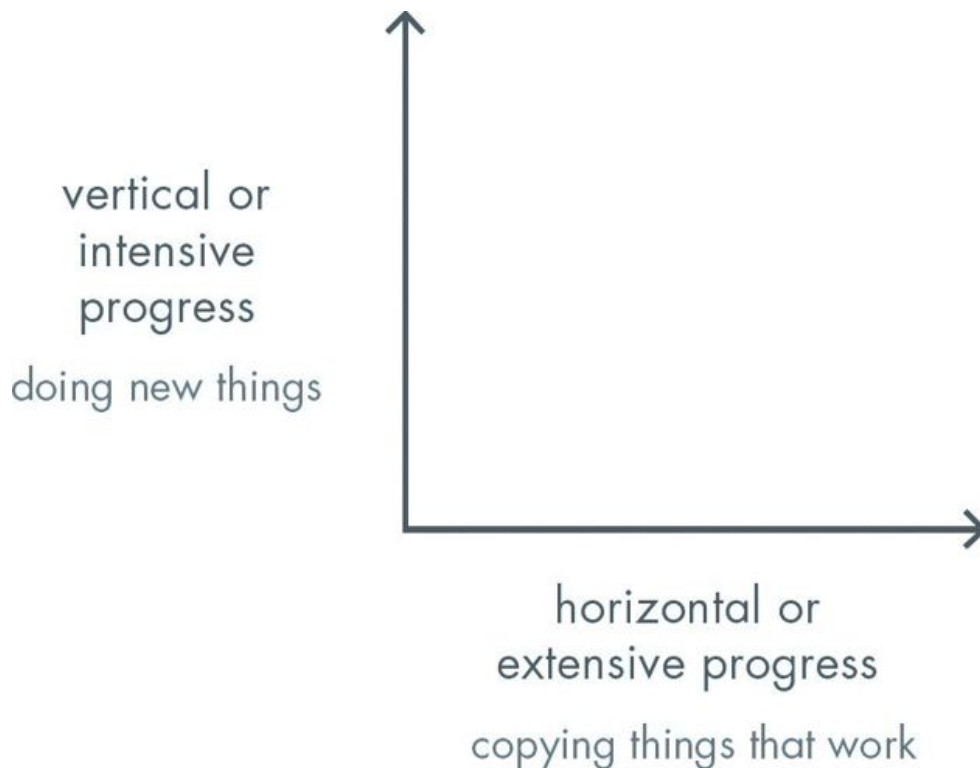
Those are bad answers. The first and the second statements might be true, but many people already agree with them. The third statement simply takes one side in a familiar debate. A good answer takes the following form: “Most people believe in x , but the truth is the opposite of x .” I’ll give my own answer later in this chapter.

What does this contrarian question have to do with the future? In the most minimal sense, the future is simply the set of all moments yet to come. But what makes the future distinctive and important isn’t that it hasn’t happened yet, but rather that it will be a time when the world looks different from today. In this sense, if nothing about our society changes for the next 100 years, then the future is over 100 years away. If things change radically in the next decade, then the future is nearly at hand. No one can predict the future exactly, but we know two things: it’s going to be different, and it

must be rooted in today's world. Most answers to the contrarian question are different ways of seeing the present; good answers are as close as we can come to looking into the future.

ZERO TO ONE: THE FUTURE OF PROGRESS

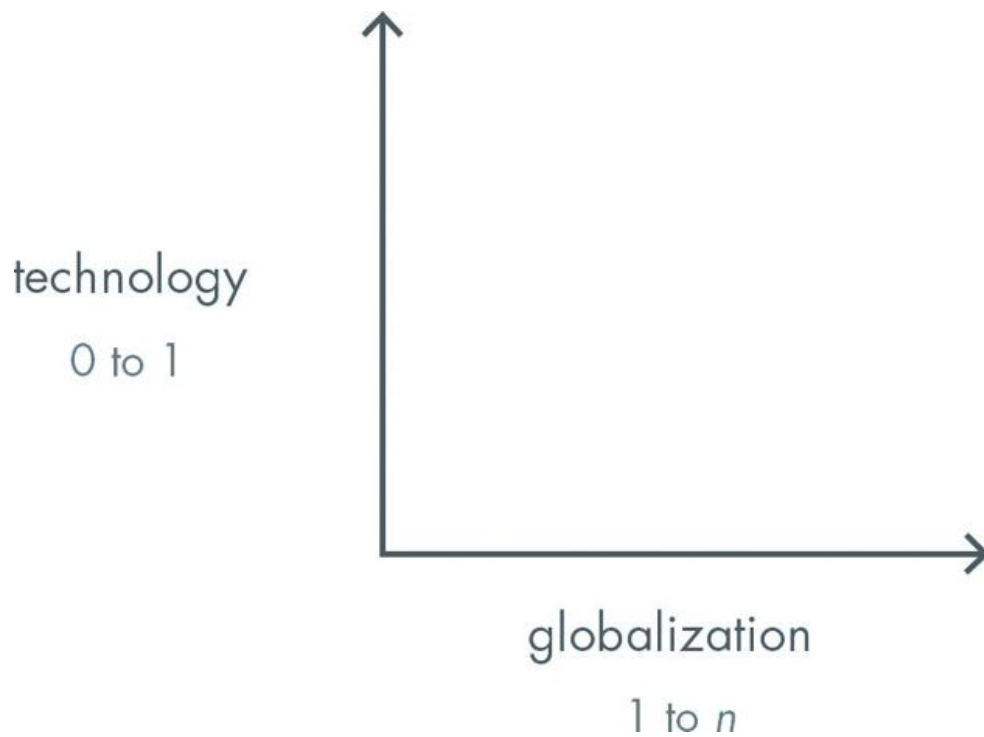
When we think about the future, we hope for a future of progress. That progress can take one of two forms. Horizontal or extensive progress means copying things that work—going from 1 to n . Horizontal progress is easy to imagine because we already know what it looks like. Vertical or intensive progress means doing new things—going from 0 to 1. Vertical progress is harder to imagine because it requires doing something nobody else has ever done. If you take one typewriter and build 100, you have made horizontal progress. If you have a typewriter and build a word processor, you have made vertical progress.



At the macro level, the single word for horizontal progress is *globalization*—taking things that work somewhere and making them work everywhere. China is the paradigmatic example of globalization; its 20-year plan is to become like the United States is today. The Chinese have been

straightforwardly copying everything that has worked in the developed world: 19th-century railroads, 20th-century air conditioning, and even entire cities. They might skip a few steps along the way—going straight to wireless without installing landlines, for instance—but they’re copying all the same.

The single word for vertical, 0 to 1 progress is *technology*. The rapid progress of information technology in recent decades has made Silicon Valley the capital of “technology” in general. But there is no reason why technology should be limited to computers. Properly understood, any new and better way of doing things is technology.



Because globalization and technology are different modes of progress, it’s possible to have both, either, or neither at the same time. For example, 1815 to 1914 was a period of both rapid technological development and rapid globalization. Between the First World War and Kissinger’s trip to reopen relations with China in 1971, there was rapid technological development but not much globalization. Since 1971, we have seen rapid globalization along with limited technological development, mostly confined to IT.

This age of globalization has made it easy to imagine that the decades ahead will bring more convergence and more sameness. Even our everyday language suggests we believe in a kind of technological end of history: the division of the world into the so-called developed and developing nations implies that the “developed” world has already achieved the achievable, and that poorer nations just need to catch up.

But I don’t think that’s true. My own answer to the contrarian question is that most people think the future of the world will be defined by globalization, but the truth is that technology matters more. Without technological change, if China doubles its energy production over the next two decades, it will also double its air pollution. If every one of India’s hundreds of millions of households were to live the way Americans already do—using only today’s tools—the result would be environmentally catastrophic. Spreading old ways to create wealth around the world will result in devastation, not riches. In a world of scarce resources, globalization without new technology is unsustainable.

New technology has never been an automatic feature of history. Our ancestors lived in static, zero-sum societies where success meant seizing things from others. They created new sources of wealth only rarely, and in the long run they could never create enough to save the average person from an extremely hard life. Then, after 10,000 years of fitful advance from primitive agriculture to medieval windmills and 16th-century astrolabes, the modern world suddenly experienced relentless technological progress from the advent of the steam engine in the 1760s all the way up to about 1970. As a result, we have inherited a richer society than any previous generation would have been able to imagine.

Any generation excepting our parents’ and grandparents’, that is: in the late 1960s, they expected this progress to continue. They looked forward to a four-day workweek, energy too cheap to meter, and vacations on the moon. But it didn’t happen. The smartphones that distract us from our surroundings also distract us from the fact that our surroundings are strangely old: only computers and communications have improved dramatically since midcentury. That doesn’t mean our parents were wrong to imagine a better future—they were only wrong to expect it as something automatic. Today our challenge is to both imagine and create the new

technologies that can make the 21st century more peaceful and prosperous than the 20th.

STARTUP THINKING

New technology tends to come from new ventures—startups. From the Founding Fathers in politics to the Royal Society in science to Fairchild Semiconductor’s “traitorous eight” in business, small groups of people bound together by a sense of mission have changed the world for the better. The easiest explanation for this is negative: it’s hard to develop new things in big organizations, and it’s even harder to do it by yourself. Bureaucratic hierarchies move slowly, and entrenched interests shy away from risk. In the most dysfunctional organizations, signaling that work is being done becomes a better strategy for career advancement than actually doing work (if this describes your company, you should quit now). At the other extreme, a lone genius might create a classic work of art or literature, but he could never create an entire industry. Startups operate on the principle that you need to work with other people to get stuff done, but you also need to stay small enough so that you actually can.

Positively defined, a startup is the largest group of people you can convince of a plan to build a different future. A new company’s most important strength is new thinking: even more important than nimbleness, small size affords space to think. This book is about the questions you must ask and answer to succeed in the business of doing new things: what follows is not a manual or a record of knowledge but an exercise in thinking. Because that is what a startup has to do: question received ideas and rethink business from scratch.

PARTY LIKE IT'S 1999

OUR CONTRARIAN QUESTION—*What important truth do very few people agree with you on?*—is difficult to answer directly. It may be easier to start with a preliminary: what does everybody agree on? “Madness is rare in individuals—but in groups, parties, nations, and ages it is the rule,” Nietzsche wrote (before he went mad). If you can identify a delusional popular belief, you can find what lies hidden behind it: the contrarian truth.

Consider an elementary proposition: companies exist to make money, not to lose it. This should be obvious to any thinking person. But it wasn't so obvious to many in the late 1990s, when no loss was too big to be described as an investment in an even bigger, brighter future. The conventional wisdom of the “New Economy” accepted page views as a more authoritative, forward-looking financial metric than something as pedestrian as profit.

Conventional beliefs only ever come to appear arbitrary and wrong in retrospect; whenever one collapses, we call the old belief a *bubble*. But the distortions caused by bubbles don't disappear when they pop. The internet craze of the '90s was the biggest bubble since the crash of 1929, and the lessons learned afterward define and distort almost all thinking about technology today. The first step to thinking clearly is to question what we think we know about the past.

A QUICK HISTORY OF THE '90S

The 1990s have a good image. We tend to remember them as a prosperous, optimistic decade that happened to end with the internet boom and bust. But many of those years were not as cheerful as our nostalgia holds. We've long since forgotten the global context for the 18 months of dot-com mania at decade's end.

The '90s started with a burst of euphoria when the Berlin Wall came down in November '89. It was short-lived. By mid-1990, the United States was in recession. Technically the downturn ended in March '91, but recovery was slow and unemployment continued to rise until July '92. Manufacturing never fully rebounded. The shift to a service economy was protracted and painful.

1992 through the end of 1994 was a time of general malaise. Images of dead American soldiers in Mogadishu looped on cable news. Anxiety about globalization and U.S. competitiveness intensified as jobs flowed to Mexico. This pessimistic undercurrent drove then-president Bush 41 out of office and won Ross Perot nearly 20% of the popular vote in '92—the best showing for a third-party candidate since Theodore Roosevelt in 1912. And whatever the cultural fascination with Nirvana, grunge, and heroin reflected, it wasn't hope or confidence.

Silicon Valley felt sluggish, too. Japan seemed to be winning the semiconductor war. The internet had yet to take off, partly because its commercial use was restricted until late 1992 and partly due to the lack of user-friendly web browsers. It's telling that when I arrived at Stanford in 1985, economics, not computer science, was the most popular major. To most people on campus, the tech sector seemed idiosyncratic or even provincial.

The internet changed all this. The Mosaic browser was officially released in November 1993, giving regular people a way to get online. Mosaic became Netscape, which released its Navigator browser in late 1994. Navigator's adoption grew so quickly—from about 20% of the browser

market in January 1995 to almost 80% less than 12 months later—that Netscape was able to IPO in August '95 even though it wasn't yet profitable. Within five months, Netscape stock had shot up from \$28 to \$174 per share. Other tech companies were booming, too. Yahoo! went public in April '96 with an \$848 million valuation. Amazon followed suit in May '97 at \$438 million. By spring of '98, each company's stock had more than quadrupled. Skeptics questioned earnings and revenue multiples higher than those for any non-internet company. It was easy to conclude that the market had gone crazy.

This conclusion was understandable but misplaced. In December '96—more than three years before the bubble actually burst—Fed chairman Alan Greenspan warned that “irrational exuberance” might have “unduly escalated asset values.” Tech investors were exuberant, but it's not clear that they were so irrational. It is too easy to forget that things weren't going very well in the rest of the world at the time.

The East Asian financial crises hit in July 1997. Crony capitalism and massive foreign debt brought the Thai, Indonesian, and South Korean economies to their knees. The ruble crisis followed in August '98 when Russia, hamstrung by chronic fiscal deficits, devalued its currency and defaulted on its debt. American investors grew nervous about a nation with 10,000 nukes and no money; the Dow Jones Industrial Average plunged more than 10% in a matter of days.

People were right to worry. The ruble crisis set off a chain reaction that brought down Long-Term Capital Management, a highly leveraged U.S. hedge fund. LTCM managed to lose \$4.6 billion in the latter half of 1998, and still had over \$100 billion in liabilities when the Fed intervened with a massive bailout and slashed interest rates in order to prevent systemic disaster. Europe wasn't doing that much better. The euro launched in January 1999 to great skepticism and apathy. It rose to \$1.19 on its first day of trading but sank to \$0.83 within two years. In mid-2000, G7 central bankers had to prop it up with a multibillion-dollar intervention.

So the backdrop for the short-lived dot-com mania that started in September 1998 was a world in which nothing else seemed to be working. The Old Economy couldn't handle the challenges of globalization. Something needed to work—and work in a big way—if the future was

going to be better at all. By indirect proof, the New Economy of the internet was the only way forward.

MANIA: SEPTEMBER 1998–MARCH 2000

Dot-com mania was intense but short—18 months of insanity from September 1998 to March 2000. It was a Silicon Valley gold rush: there was money everywhere, and no shortage of exuberant, often sketchy people to chase it. Every week, dozens of new startups competed to throw the most lavish launch party. (Landing parties were much more rare.) Paper millionaires would rack up thousand-dollar dinner bills and try to pay with shares of their startup’s stock—sometimes it even worked. Legions of people decamped from their well-paying jobs to found or join startups. One 40-something grad student that I knew was running six different companies in 1999. (Usually, it’s considered weird to be a 40-year-old graduate student. Usually, it’s considered insane to start a half-dozen companies at once. But in the late ’90s, people could believe that was a winning combination.) Everybody should have known that the mania was unsustainable; the most “successful” companies seemed to embrace a sort of anti-business model where they *lost* money as they grew. But it’s hard to blame people for dancing when the music was playing; irrationality was rational given that appending “.com” to your name could double your value overnight.

DOT-COM BOOM



PAYPAL MANIA

When I was running PayPal in late 1999, I was scared out of my wits—not because I didn't believe in our company, but because it seemed like everyone else in the Valley was ready to believe anything at all. Everywhere I looked, people were starting and flipping companies with alarming casualness. One acquaintance told me how he had planned an IPO from his living room before he'd even incorporated his company—and he didn't think that was weird. In this kind of environment, acting sanely began to seem eccentric.

At least PayPal had a suitably grand mission—the kind that post-bubble skeptics would later describe as grandiose: we wanted to create a new internet currency to replace the U.S. dollar. Our first product let people beam money from one PalmPilot to another. However, nobody had any use for that product except the journalists who voted it one of the 10 worst business ideas of 1999. PalmPilots were still too exotic then, but email was already commonplace, so we decided to create a way to send and receive payments over email.

By the fall of '99, our email payment product worked well—anyone could log in to our website and easily transfer money. But we didn't have enough customers, growth was slow, and expenses mounted. For PayPal to work, we needed to attract a critical mass of at least a million users. Advertising was too ineffective to justify the cost. Prospective deals with big banks kept falling through. So we decided to pay people to sign up.

We gave new customers \$10 for joining, and we gave them \$10 more every time they referred a friend. This got us hundreds of thousands of new customers and an exponential growth rate. Of course, this customer acquisition strategy was unsustainable on its own—when you pay people to be your customers, exponential growth means an exponentially growing cost structure. Crazy costs were typical at that time in the Valley. But we thought our huge costs were sane: given a large user base, PayPal had a clear path to profitability by taking a small fee on customers' transactions.

We knew we'd need more funding to reach that goal. We also knew that the boom was going to end. Since we didn't expect investors' faith in our mission to survive the coming crash, we moved fast to raise funds while we could. On February 16, 2000, the *Wall Street Journal* ran a story lauding our viral growth and suggesting that PayPal was worth \$500 million. When we raised \$100 million the next month, our lead investor took the *Journal's* back-of-the-envelope valuation as authoritative. (Other investors were in even more of a hurry. A South Korean firm wired us \$5 million without first negotiating a deal or signing any documents. When I tried to return the money, they wouldn't tell me where to send it.) That March 2000 financing round bought us the time we needed to make PayPal a success. Just as we closed the deal, the bubble popped.

LESSONS LEARNED

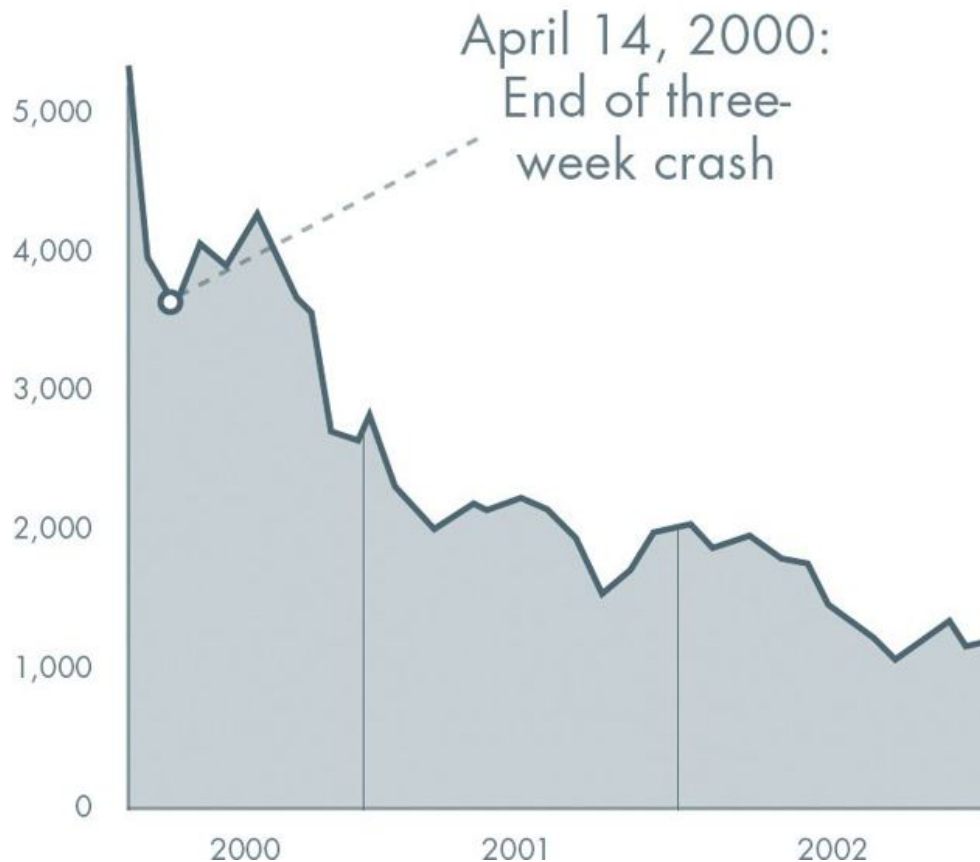
*'Cause they say 2,000 zero zero party over, oops! Out of time!
So tonight I'm gonna party like it's 1999!*

—PRINCE

The NASDAQ reached 5,048 at its peak in the middle of March 2000 and then crashed to 3,321 in the middle of April. By the time it bottomed out at 1,114 in October 2002, the country had long since interpreted the market's collapse as a kind of divine judgment against the technological optimism of the '90s. The era of cornucopian hope was relabeled as an era of crazed greed and declared to be definitely over.

Everyone learned to treat the future as fundamentally indefinite, and to dismiss as an extremist anyone with plans big enough to be measured in years instead of quarters. Globalization replaced technology as the hope for the future. Since the '90s migration "from bricks to clicks" didn't work as hoped, investors went back to bricks (housing) and BRICs (globalization). The result was another bubble, this time in real estate.

DOT-COM BUST



The entrepreneurs who stuck with Silicon Valley learned four big lessons from the dot-com crash that still guide business thinking today:

1. Make incremental advances

Grand visions inflated the bubble, so they should not be indulged. Anyone who claims to be able to do something great is suspect, and anyone who wants to change the world should be more humble. Small, incremental steps are the only safe path forward.

2. Stay lean and flexible

All companies must be “lean,” which is code for “unplanned.” You should not know what your business will do; planning is arrogant and

inflexible. Instead you should try things out, “iterate,” and treat entrepreneurship as agnostic experimentation.

3. Improve on the competition

Don't try to create a new market prematurely. The only way to know you have a real business is to start with an already existing customer, so you should build your company by improving on recognizable products already offered by successful competitors.

4. Focus on product, not sales

If your product requires advertising or salespeople to sell it, it's not good enough: technology is primarily about product development, not distribution. Bubble-era advertising was obviously wasteful, so the only sustainable growth is viral growth.

These lessons have become dogma in the startup world; those who would ignore them are presumed to invite the justified doom visited upon technology in the great crash of 2000. And yet the opposite principles are probably more correct:

1. It is better to risk boldness than triviality.

2. A bad plan is better than no plan.

3. Competitive markets destroy profits.

4. Sales matters just as much as product.

It's true that there was a bubble in technology. The late '90s was a time of hubris: people believed in going from 0 to 1. Too few startups were actually getting there, and many never went beyond talking about it. But people understood that we had no choice but to find ways to do more with less. The market high of March 2000 was obviously a peak of insanity; less obvious but more important, it was also a peak of clarity. People looked far into the future, saw how much valuable new technology we would need to get there safely, and judged themselves capable of creating it.

We still need new technology, and we may even need some 1999-style hubris and exuberance to get it. To build the next generation of companies, we must abandon the dogmas created after the crash. That doesn't mean the opposite ideas are automatically true: you can't escape the madness of crowds by dogmatically rejecting them. Instead ask yourself: how much of what you know about business is shaped by mistaken reactions to past mistakes? The most contrarian thing of all is not to oppose the crowd but to think for yourself.