

ZERO *to* ONE

NOTES ON STARTUPS, OR

HOW TO BUILD THE FUTURE

Peter Thiel

with BLAKE MASTERS



NEW YORK

DISCLAIMER:

ReadMe website is intended for academic and demonstration purposes only.
We're only showing a preview of the book to respect the author's copyright.
Thank you for your understanding!

- Group 4: The Classified

Copyright © 2014 by Peter Thiel

All rights reserved.

Published in the United States by Crown Business, an imprint of the Crown Publishing Group, a division of Random House LLC, a Penguin Random House Company, New York.

www.crownpublishing.com



CROWN BUSINESS is a trademark and CROWN and the Rising Sun colophon are registered trademarks of Random House LLC.

Crown Business books are available at special discounts for bulk purchases for sales promotions or corporate use. Special editions, including personalized covers, excerpts of existing books, or books with corporate logos, can be created in large quantities for special needs. For more information, contact Premium Sales at (212) 572-2232 or e-mail specialmarkets@randomhouse.com.

Library of Congress Cataloging-in-Publication Data

Thiel, Peter A.

Zero to one: notes on startups, or how to build the future / Peter Thiel with Blake Masters.

pages cm

1. New business enterprises. 2. New products. 3. Entrepreneurship. 4. Diffusion of innovations. I. Title.

HD62.5.T525 2014

685.11—dc23

2014006653

Hardcover ISBN: 978-0-8041-3929-8

eBook ISBN: 978-0-8041-3930-4

Book design by Ralph Fowler / rlfdesign

Graphics by Rodrigo Corral Design

Illustrations by Matt Buck

Cover design by Michael Nagin

Additional credits appear [on this page](#), which constitutes a continuation of this copyright page.

v3.1

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.

cell phone plan from any number of providers. If the tendency of monopoly businesses were to hold back progress, they would be dangerous and we'd be right to oppose them. But the history of progress is a history of better monopoly businesses replacing incumbents.

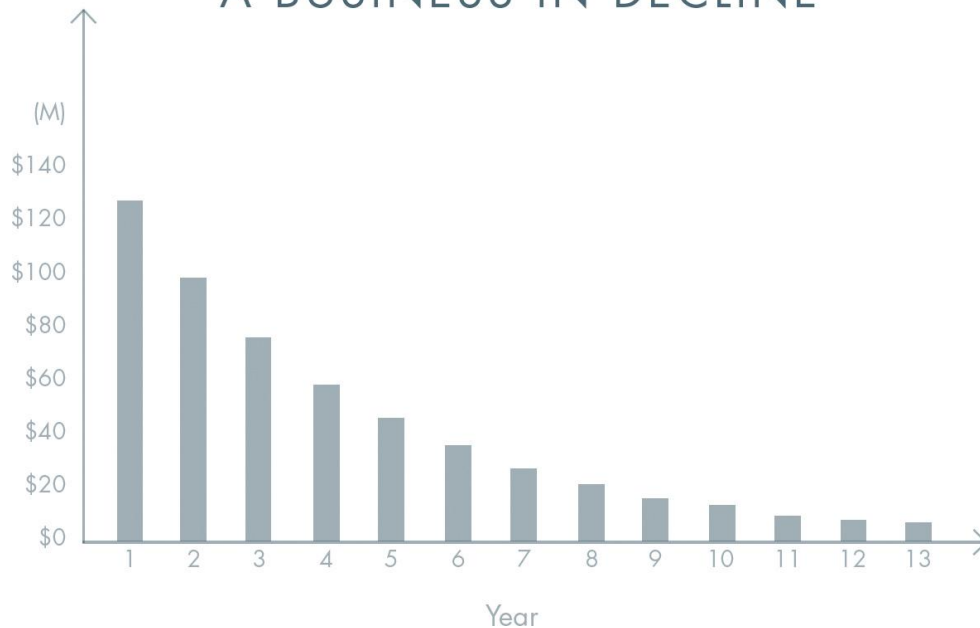
Monopolies drive progress because the promise of years or even decades of monopoly profits provides a powerful incentive to innovate. Then monopolies can keep innovating because profits enable them to make the long-term plans and to finance the ambitious research projects that firms locked in competition can't dream of.

So why are economists obsessed with competition as an ideal state? It's a relic of history. Economists copied their mathematics from the work of 19th-century physicists: they see individuals and businesses as interchangeable atoms, not as unique creators. Their theories describe an equilibrium state of perfect competition because that's what's easy to model, not because it represents the best of business. But it's worth recalling that the long-run equilibrium predicted by 19th-century physics was a state in which all energy is evenly distributed and everything comes to rest—also known as the heat death of the universe. Whatever your views on thermodynamics, it's a powerful metaphor: in business, equilibrium means stasis, and stasis means death. If your industry is in a competitive equilibrium, the death of your business won't matter to the world; some other undifferentiated competitor will always be ready to take your place.

Perfect equilibrium may describe the void that is most of the universe. It may even characterize many businesses. But every new creation takes place far from equilibrium. In the real world outside economic theory, every business is successful exactly to the extent that it does something others cannot. Monopoly is therefore not a pathology or an exception. *Monopoly is the condition of every successful business.*

Tolstoy opens *Anna Karenina* by observing: "All happy families are alike; each unhappy family is unhappy in its own way." Business is the opposite. All happy companies are different: each one earns a monopoly by solving a unique problem. All failed companies are the same: they failed to escape competition.

PRESENT VALUE CASH FLOWS OF A BUSINESS IN DECLINE



In March 2001, PayPal had yet to make a profit but our revenues were growing 100% year-over-year. When I projected our future cash flows, I found that 75% of the company's present value would come from profits generated in 2011 and beyond—hard to believe for a company that had been in business for only 27 months. But even that turned out to be an underestimation. Today, PayPal continues to grow at about 15% annually, and the discount rate is lower than a decade ago. It now appears that most of the company's value will come from 2020 and beyond.

LinkedIn is another good example of a company whose value exists in the far future. As of early 2014, its market capitalization was \$24.5 billion—very high for a company with less than \$1 billion in revenue and only \$21.6 million in net income for 2012. You might look at these numbers and conclude that investors have gone insane. But this valuation makes sense when you consider LinkedIn's projected future cash flows.

THE LAST WILL BE FIRST

You've probably heard about "first mover advantage": if you're the first entrant into a market, you can capture significant market share while competitors scramble to get started. But moving first is a tactic, not a goal. What really matters is generating cash flows in the future, so being the first mover doesn't do you any good if someone else comes along and unseats you. It's much better to be the *last* mover—that is, to make the last great development in a specific market and enjoy years or even decades of monopoly profits. The way to do that is to dominate a small niche and scale up from there, toward your ambitious long-term vision. In this one particular at least, business is like chess. Grandmaster José Raúl Capablanca put it well: to succeed, "you must study the endgame before everything else."

myth of the self-made businessman, but actually his own account encapsulates the conventional view of a generation.

YOU ARE NOT A LOTTERY TICKET

We have to find our way back to a definite future, and the Western world needs nothing short of a cultural revolution to do it.

Where to start? John Rawls will need to be displaced in philosophy departments. Malcolm Gladwell must be persuaded to change his theories. And pollsters have to be driven from politics. But the philosophy professors and the Gladwells of the world are set in their ways, to say nothing of our politicians. It's extremely hard to make changes in those crowded fields, even with brains and good intentions.

A startup is the largest endeavor over which you can have definite mastery. You can have agency not just over your own life, but over a small and important part of the world. It begins by rejecting the unjust tyranny of Chance. You are not a lottery ticket.

WHAT TO DO WITH THE POWER LAW

The power law is not just important to investors; rather, it's important to everybody because everybody is an investor. An entrepreneur makes a major investment just by spending her time working on a startup. Therefore every entrepreneur must think about whether her company is going to succeed and become valuable. Every individual is unavoidably an investor, too. When you choose a career, you act on your belief that the kind of work you do will be valuable decades from now.

The most common answer to the question of future value is a diversified portfolio: "Don't put all your eggs in one basket," everyone has been told. As we said, even the best venture investors have a portfolio, but investors who understand the power law make as few investments as possible. The kind of portfolio thinking embraced by both folk wisdom and financial convention, by contrast, regards diversified betting as a source of strength. The more you dabble, the more you are supposed to have hedged against the uncertainty of the future.

But life is not a portfolio: not for a startup founder, and not for any individual. An entrepreneur cannot "diversify" herself: you cannot run dozens of companies at the same time and then hope that one of them works out well. Less obvious but just as important, an individual cannot diversify his own life by keeping dozens of equally possible careers in ready reserve.

Our schools teach the opposite: institutionalized education traffics in a kind of homogenized, generic knowledge. Everybody who passes through the American school system learns *not* to think in power law terms. Every high school course period lasts 45 minutes whatever the subject. Every student proceeds at a similar pace. At college, model students obsessively hedge their futures by assembling a suite of exotic and minor skills. Every university believes in "excellence," and hundred-page course catalogs arranged alphabetically according to arbitrary departments of knowledge seem designed to reassure you that "it doesn't matter what you do, as long as you do it well." That is completely false. It does matter what you do. You should focus

THE CASE FOR SECRETS

You can't find secrets without looking for them. Andrew Wiles demonstrated this when he proved Fermat's Last Theorem after 358 years of fruitless inquiry by other mathematicians—the kind of sustained failure that might have suggested an inherently impossible task. Pierre de Fermat had conjectured in 1637 that no integers a , b , and c could satisfy the equation $a^n + b^n = c^n$ for any integer n greater than 2. He claimed to have a proof, but he died without writing it down, so his conjecture long remained a major unsolved problem in mathematics. Wiles started working on it in 1986, but he kept it a secret until 1993, when he knew he was nearing a solution. After nine years of hard work, Wiles proved the conjecture in 1995. He needed brilliance to succeed, but he also needed a faith in secrets. If you think something hard is impossible, you'll never even start trying to achieve it. Belief in secrets is an effective truth.

The actual truth is that there are many more secrets left to find, but they will yield only to relentless searchers. There is more to do in science, medicine, engineering, and in technology of all kinds. We are within reach not just of marginal goals set at the competitive edge of today's conventional disciplines, but of ambitions so great that even the boldest minds of the Scientific Revolution hesitated to announce them directly. We could cure cancer, dementia, and all the diseases of age and metabolic decay. We can find new ways to generate energy that free the world from conflict over fossil fuels. We can invent faster ways to travel from place to place over the surface of the planet; we can even learn how to escape it entirely and settle new frontiers. But we will never learn any of these secrets unless we demand to know them and force ourselves to look.

The same is true of business. Great companies can be built on open but unsuspected secrets about how the world works. Consider the Silicon Valley startups that have harnessed the spare capacity that is all around us but often ignored. Before Airbnb, travelers had little choice but to pay high prices for a hotel room, and property owners couldn't easily and reliably rent out their unoccupied space. Airbnb saw untapped supply and unaddressed demand where

for his venture firm, while the founders would prefer to stay private and grow the business.

In the boardroom, less is more. The smaller the board, the easier it is for the directors to communicate, to reach consensus, and to exercise effective oversight. However, that very effectiveness means that a small board can forcefully oppose management in any conflict. This is why it's crucial to choose wisely: every single member of your board matters. Even one problem director will cause you pain, and may even jeopardize your company's future.

A board of three is ideal. Your board should never exceed five people, unless your company is publicly held. (Government regulations effectively mandate that public companies have larger boards—the average is nine members.) By far the worst you can do is to make your board extra large. When unsavvy observers see a nonprofit organization with dozens of people on its board, they think: “Look how many great people are committed to this organization! It must be extremely well run.” Actually, a huge board will exercise no effective oversight at all; it merely provides cover for whatever microdictator actually runs the organization. If you want that kind of free rein from your board, blow it up to giant size. If you want an effective board, keep it small.

Above all, don't fight the perk war. Anybody who would be more powerfully swayed by free laundry pickup or pet day care would be a bad addition to your team. Just cover the basics like health insurance and then promise what no others can: the opportunity to do irreplaceable work on a unique problem alongside great people. You probably can't be the Google of 2014 in terms of compensation or perks, but you *can* be like the Google of 1999 if you already have good answers about your mission and team.

In 2008, Box had a good way for companies to store their data safely and accessibly in the cloud. But people didn't know they needed such a thing—cloud computing hadn't caught on yet. That summer, Blake was hired as Box's third salesperson to help change that. Starting with small groups of users who had the most acute file sharing problems, Box's sales reps built relationships with more and more users in each client company. In 2009, Blake sold a small Box account to the Stanford Sleep Clinic, where researchers needed an easy, secure way to store experimental data logs. Today the university offers a Stanford-branded Box account to every one of its students and faculty members, and Stanford Hospital runs on Box. If it had started off by trying to sell the president of the university on an enterprise-wide solution, Box would have sold nothing. A complex sales approach would have made Box a forgotten startup failure; instead, personal sales made it a multibillion-dollar business.

Sometimes the product itself is a kind of distribution. ZocDoc is a Founders Fund portfolio company that helps people find and book medical appointments online. The company charges doctors a few hundred dollars per month to be included in its network. With an average deal size of just a few thousand dollars, ZocDoc needs lots of salespeople—so many that they have an internal recruiting team to do nothing but hire more. But making personal sales to doctors doesn't just bring in revenue; by adding doctors to the network, salespeople make the product more valuable to consumers (and more consumer users increases its appeal to doctors). More than 5 million people already use the service each month, and if it can continue to scale its network to include a majority of practitioners, it will become a fundamental utility for the U.S. health care industry.

Distribution Doldrums

In between personal sales (salespeople obviously required) and traditional advertising (no salespeople required) there is a dead zone. Suppose you create a software service that helps convenience store owners track their inventory and manage ordering. For a product priced around \$1,000, there might be no good distribution channel to reach the small businesses that might buy it. Even if you have a clear value proposition, how do you get people to hear it? Advertising would either be too broad (there's no TV channel that only convenience store

COMPLEMENTARY BUSINESSES

Complementarity between computers and humans isn't just a macro-scale fact. It's also the path to building a great business. I came to understand this from my experience at PayPal. In mid-2000, we had survived the dot-com crash and we were growing fast, but we faced one huge problem: we were losing upwards of \$10 million to credit card fraud every month. Since we were processing hundreds or even thousands of transactions per minute, we couldn't possibly review each one—no human quality control team could work that fast.

So we did what any group of engineers would do: we tried to automate a solution. First, Max Levchin assembled an elite team of mathematicians to study the fraudulent transfers in detail. Then we took what we learned and wrote software to automatically identify and cancel bogus transactions in real time. But it quickly became clear that this approach wouldn't work either: after an hour or two, the thieves would catch on and change their tactics. We were dealing with an adaptive enemy, and our software couldn't adapt in response.

The fraudsters' adaptive evasions fooled our automatic detection algorithms, but we found that they didn't fool our human analysts as easily. So Max and his engineers rewrote the software to take a hybrid approach: the computer would flag the most suspicious transactions on a well-designed user interface, and human operators would make the final judgment as to their legitimacy. Thanks to this hybrid system—we named it “Igor,” after the Russian fraudster who bragged that we'd never be able to stop him—we turned our first quarterly profit in the first quarter of 2002 (as opposed to a quarterly loss of \$29.3 million one year before). The FBI asked us if we'd let them use Igor to help detect financial crime. And Max was able to boast, grandiosely but truthfully, that he was “the Sherlock Holmes of the Internet Underground.”

This kind of man-machine symbiosis enabled PayPal to stay in business, which in turn enabled hundreds of thousands of small businesses to accept the payments they needed to thrive on the internet. None of it would have been possible without the man-machine solution—even though most people would never see it or even hear about it.

THE TIMING QUESTION

Cleantech entrepreneurs worked hard to convince themselves that their appointed hour had arrived. When he announced his new company in 2008, SpectraWatt CEO Andrew Wilson stated that “[t]he solar industry is akin to where the microprocessor industry was in the late 1970s. There is a lot to be figured out and improved.” The second part was right, but the microprocessor analogy was way off. Ever since the first microprocessor was built in 1970, computing advanced not just rapidly but exponentially. Look at Intel’s early product release history:

Generation	Processor Model	Year
4-bit	4004	1971
8-bit	8008	1972
16-bit	8086	1978
32-bit	iAPX 432	1981

The first silicon solar cell, by contrast, was created by Bell Labs in 1954—more than *a half century* before Wilson’s press release. Photovoltaic efficiency improved in the intervening decades, but slowly and linearly: Bell’s first solar cell had about 6% efficiency; neither today’s crystalline silicon cells nor modern thin-film cells have exceeded 25% efficiency in the field. There were few engineering developments in the mid-2000s to suggest impending liftoff.

THE MYTH OF SOCIAL ENTREPRENEURSHIP

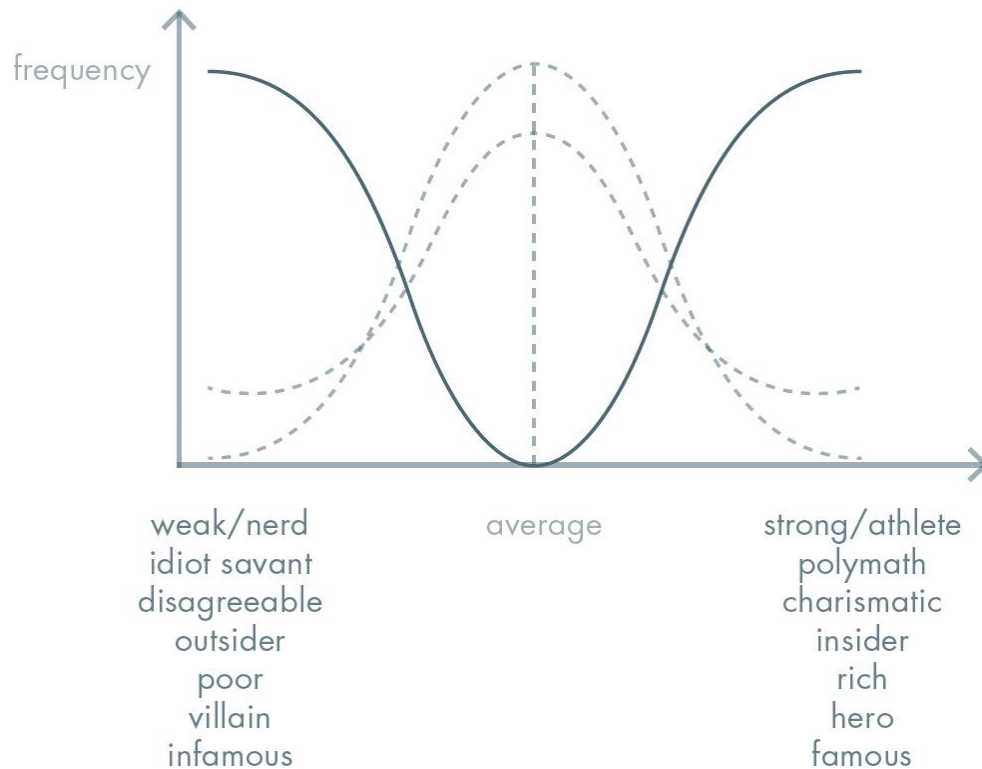
Cleantech entrepreneurs aimed for more than just success as most businesses define it. The cleantech bubble was the biggest phenomenon—and the biggest flop—in the history of “social entrepreneurship.” This philanthropic approach to business starts with the idea that corporations and nonprofits have until now been polar opposites: corporations have great power, but they’re shackled to the profit motive; nonprofits pursue the public interest, but they’re weak players in the wider economy. Social entrepreneurs aim to combine the best of both worlds and “do well by doing good.” Usually they end up doing neither.

The ambiguity between social and financial goals doesn’t help. But the ambiguity in the word “social” is even more of a problem: if something is “socially good,” is it good *for* society, or merely *seen* as good *by* society? Whatever is good enough to receive applause from all audiences can only be conventional, like the general idea of green energy.

Progress isn’t held back by some difference between corporate greed and nonprofit goodness; instead, we’re held back by the sameness of both. Just as corporations tend to copy each other, nonprofits all tend to push the same priorities. Cleantech shows the result: hundreds of undifferentiated products all in the name of one overbroad goal.

Doing something *different* is what’s truly good for society—and it’s also what allows a business to profit by monopolizing a new market. The best projects are likely to be overlooked, not trumpeted by a crowd; the best problems to work on are often the ones nobody else even tries to solve.

THE FOUNDER DISTRIBUTION



Where does this strange and extreme combination of traits come from? They could be present from birth (nature) or acquired from an individual's environment (nurture). But perhaps founders aren't really as extreme as they appear. Might they strategically exaggerate certain qualities? Or is it possible that everyone else exaggerates them? All of these effects can be present at the same time, and whenever present they powerfully reinforce each other. The cycle usually starts with unusual people and ends with them acting and seeming even more unusual:

effectively kicked Jobs out of his own company when he clashed with the professional CEO brought in to provide adult supervision.

Jobs's return to Apple 12 years later shows how the most important task in business—the creation of new value—cannot be reduced to a formula and applied by professionals. When he was hired as interim CEO of Apple in 1997, the impeccably credentialed executives who preceded him had steered the company nearly to bankruptcy. That year Michael Dell famously said of Apple, “What would I do? I’d shut it down and give the money back to the shareholders.” Instead Jobs introduced the iPod (2001), the iPhone (2007), and the iPad (2010) before he had to resign in 2011 because of poor health. By the following year Apple was the single most valuable company in the world.

Apple's value crucially depended on the singular vision of a particular person. This hints at the strange way in which the companies that create new technology often resemble feudal monarchies rather than organizations that are supposedly more “modern.” A unique founder can make authoritative decisions, inspire strong personal loyalty, and plan ahead for decades. Paradoxically, impersonal bureaucracies staffed by trained professionals can last longer than any lifetime, but they usually act with short time horizons.

The lesson for business is that we need founders. If anything, we should be more tolerant of founders who seem strange or extreme; we need unusual individuals to lead companies beyond mere incrementalism.

The lesson for founders is that individual prominence and adulation can never be enjoyed except on the condition that it may be exchanged for individual notoriety and demonization at any moment—so be careful.

Above all, don't overestimate your own power as an individual. Founders are important not because they are the only ones whose work has value, but rather because a great founder can bring out the best work from everybody at his company. That we need individual founders in all their peculiarity does not mean that we are called to worship Ayn Randian “prime movers” who claim to be independent of everybody around them. In this respect Rand was a merely half-great writer: her villains were real, but her heroes were fake. There is no Galt's Gulch. There is no secession from society. To believe yourself invested with divine self-sufficiency is not the mark of a strong individual, but of a person who has mistaken the crowd's worship—or jeering—for the truth. The single greatest danger for a founder is to become so certain of his own myth that