Zero to One

NOTE: *You still need to read the book (likely more than once) to understand context of the bullet points in this document.*

When it comes to books that have changed my entire world view about a particular topic, *Zero to One* tops the list when it comes to the intersection of business and technology. Lots of books have been written about startups. **But what makes *Zero to One* special in my view is that it better explains why the failure rate for startups is so high.**

In high school, I recall saying to myself that success **-** however broadly defined **-** was generally the result of doing one or more of the following: **Doing something *better,* or doing something *different.*** The book in question has convinced me that the latter may be more important when it comes to creating true value in the world.

Preface:

- Copying == going from 1 to N
- Innovation == going from 0 to 1
- Doing something better < Doing something different
- Technology allows us to do more with less
- Every innovation is new/unique, so formula for success hard to pin down

1. The Challenge of the Future:

- **"What important truth do very few people agree with you on?"**
- *"Most people believe X, but the truth is the opposite of X."*
- Most incomplete answers to the contrarian question are different ways of seeing the present
- Horizontal vs Vertical progress, globalization vs new technology
- Thiel's answer: **Technology matters more than globalization**
- Technology is anti-zero sum compared to raw agriculture alone
- Startup == largest group of people you can convince to build different plan for the future

2. Party Like It's 1999:

- Answering the contrarian question begins with asking *what everyone agrees on*
- **Paypal growth strategy:** *Pay people noticable sum to sign up, tiny but ongoing transaction fees*
- Dot-com bubble meant people left "clicks" and went back to "bricks" as investments - real estate bubble
- **The real lessons the startup world should've learned:**
    1. Better to risk boldness than triviality
    2. Bad plan is better than no plan
    3. Competitive markets destroy profits
    4. Sales matter as much as product

3. All Happy Companies Are Different:

- Business version of CQ: *What valuable company is nobody building?*
- Creating value isn't enough, must *capture* some of the value created
- Consider airline company profits (market value) vs Google (market captured)
- **Perfect competition:** *No company ends up making any real profit*
- **Differentiated monopoly:** *A firm so good at what it does, there isn't a substitute*
- Whether Google == monopoly depends on market you classify it under (search vs advertising)
- Non-differentiated companies overfit certain features to claim they're more unique overall
- Fewer competitors means more focus on workers, products, and wider impact on the world
- Differentiated monopoly profits only bad in a world where nothing ever changes
- Static world == Monopolist is a rent collector, Dynamic world == new categories of abundance
- Government *creates* monopolies (patents) and also hunts them down (antitrust cases)
- Distinctiveness of new "monopolies" are why the old ones don't necessarily strangle innovation
- iOS distinct enough to take market share from Microsoft, which itself took market share from IBM
- Perfect competition easy to model, that doesn't make it better for economies overall (heat death)

4. Ideology of Competition:

- Ellison believed it was good to have an enemy that simply *appeared* threatening as an incentive
- If you can't beat a rival, it may be better to merge with them altogether, profit from distinction

5. Last Mover Advantage:

- Not enough to escape competition - a business must endure in the future as well
- Great businesses (and present valuations) are defined by future cash flow patterns
- *"The value of a business today is the sum of all the money it will make in the future"*
- Low-growth businesses typically make most money in near-term (nightclubs, restaurants)
- Tech companies are opposite - they often *lose* money for the first few years, delayed revenue
- Companies must *grow* and *endure* - former is easy to measure, hence why it's most hyped
- **Company Durability:** *Proprietary tech, network effects, economies of scale, and branding*
- **Proprietary tech:** Must be *10x better* than closest substitute in *important dimension* to matter
- Easiest way to do the above is to do something totally new, otherwise improve existing option(s)
- Amazon with 10x as many books + ease of finding them is a key example of a 10x improvement
- **Network effects:** Product becomes more useful as more people use it, critical for durability
- A product still has to be valuable to the very first users before you can even grow network effects
- **Economies of Scale:** Cost structure improves as it gets bigger, fixed costs per sale must drop
- **Branding:** This is a monopoly by definition, but the brand must be strong (Apple for instance)
- Do not begin with brand instead of substance, no company can be built on branding alone (Fyre…)
- Every startup should start with a very small market, and too small is better than too large
- Keep in mind that small market should *not mean non-existent,* or one you *can't branch from* later
- Paypal did the above by starting with about 25% of eBay's "PowerSellers" after 3 months of effort
- Easier for them to target a *few thousand* people who *needed Paypal* than millions of random people
- *"Capture small % of big market"* either lacks a good starting point or is open to many competitors
- **Scaling:** knowing when you dominate niche, gradually expanding into related but broader markets
- Amazon: expand *# of people* who read books, or the variety of *things they sold* (they did the latter)
- eBay limit: auction model only works for distinctive commodity products, not pencils or Kleenex
- *Sequencing markets* is underrated but still very important when expanding overall sales
- **Don't disrupt:** If a company is summed by opposition to existing firms, it's not completely new
- Paypal never *directly challenged* large competitors, they expanded payment market (helped Visa too)
- To be durable in long run, it's better to make the *last great development* (last mover) in specific market

6. You Are Not A Lottery Ticket:

- *"Success is largely the product of luck"* poorly explains serial entrepreneurs (non-random distribution)
- If you truly believed success is largely a matter of luck, you wouldn't be reading the book (or these notes)
- "Well-roundedness" in education is an example of an "indefinite" view of things that lacks any real focus
- Definite view favors firm convictions - such as finding the one best thing to do and acting on that belief
- **Indefinite Pessimism:** Sees a bleak future, but has no idea what to do in response to it
- **Definite Pessimism:** Believes the future can be known, but since it's bleak, must prepare for it
- **Definite Optimism:** Thinks the future will be better than the present if planning/work is done for it
- **Indefinite Optimism:** Believes the future will be better, but he doesn't know how, so doesn't plan for it
- Definitively optimistic future need engineers designing underwater cities, space settlements (examples)
- Indefinitively optimistic future consists of more bankers and lawyers, no concrete planning at all
- Biotech often puts too much focus on things that "just might work" (indefinite) rather than careful planning
- Careful planning beats random chance, Steve Jobs skipped the "minimum viable product" entirely with Apple
- Big companies often offer too much/too little when acquiring a startup and founder plans are a key reason
- Founders sell company when they're out of ideas (overpaid), definite founders w/plans don't sell (underpaid)
- *"…this is just a formality, it shouldn't take more than 10 minutes. **We're obviously not going to sell here.**"*
- **A startup is the largest endeavor over which you can have definite mastery. Reject chance, you are not a lottery ticket**

7. Follow the Money:

- Never underestimate exponential growth (example: Einstein still gets credit for things he never said)
- Small minorities often achieve disproportionate results: **Pareto principle, or 80-20 rule, Price's Law**
- The lesson is that differentiated businesses capture more value than millions of undifferentiated ones
- VCs aim to profit from promising early-stage companies, if successful they take roughly 20% of profits
- Because of high failure rate of startups, most venture funds lose money at first, but aim to break even
- Venture returns not normally distributed, company outcomes follow a power law that, most are flops
- At Founders Fund: Facebook worth more than all others, Palantir worth more than all but Facebook
- **Every single company in a venture portfolio should potentially return investment in all firms**
- Most VCs overlook the power law because it only becomes visible over time + short-term focus
- After a decade, portfolio won't be divided between winners/losers, but one investment/everything else

- VCs often don’t want to give up on an investment, so they waste time trying to fix problematic ones
- Less than 1% of new firms each year receive venture funding, VC investment < 0.2% of US GDP
- **Disproportionate returns:** 11% of private sector jobs, 21% of GDP, 12 largest tech > sum of all others
- Power law matters in life too - can’t effectively keep dozens of equally possible careers in ready reserve
- Instead, focus on something you’re good at doing, but think about whether it will remain valuable later
- Differences between *companies* will dwarf differences in *roles within them* - joining can beat starting
- Owning 100% of nothing in a company you tried to start < 0.01% of Google (especially sooner you get it)
- With startups, one market will probably be better than all others (power law)

8. Secrets:

- That which is taken for granted today was once unknown/unsuspected, secrets are knowledge to be found
- *“What valuable company is nobody building?” - answer is a secret: important + unknown, hard + doable
- Classic trichotomy of the easy, the hard, and the impossible, Unabomber thought all hard problems solved
- **Why people no longer believe in secrets:** *Incrementalism, risk aversion, complacency, flatness*
- **Incrementalism:** Schools rarely reward students for going above and beyond, same w/tenure tracks
- **Risk Aversion:** People are scared of secrets because scared of being wrong - and *alone* in that regard
- **Complacency:** Why search for secret when you can collect rents on everything that’s already been done
- **Flatness:** Given globalization, many think someone out there has already found given secret, or will soon
- The only optimistic result of these trends are that it’s now far harder to start a cult
- Saying we live in a world of no secrets is to also imply that there are no hidden injustices either
- HP’s decline can largely be attributed to not continuing the production of new products, mostly consulting
- Tom Perkins believed HP should identify promising new technologies, Patricia Dunn thought otherwise
- Collaborative consumption apps/services saw dormant capital as an untapped secret, not just reinvention
- Two kinds of secrets - secrets of nature (math/physics/chem/bio) and secrets about people (don’t know or hide)
- Secrets about people underappreciated in part because heavy education isn’t necessary to find/know them
- Fields that matter but haven’t been standardized/institutionalized often contain secrets worth finding
- Unless your beliefs are conventional, it’s normally not a good idea to tell everyone everything you know
- Only tell people those secrets on a need-to-know basis, best firms built around secrets hidden from outside

9. Foundations:

- Thiel’s law: *a startup messed up at the foundations cannot be fixed later on
- Most crucial decision will be who your co-founder is, must be compatible in the long-term
- When investing in a startup, Thiel studies the founding teams: what they know, how they work together
- **Anticipating sources of misalignment among company employees:**
    1. Ownership: usually in the form of equity
    2. Possession: who runs the firm on a day-by-day basis
    3. Control: who governs the affairs of the company
- Ownership among founders/employees/investors, possion by managers/employees, board of founders/investors control
- DMV dysfunctional because public “ownership” is nothing but, accountable to no one and misaligned with everyone
- Big firms prone to misalignment, early-stage startups small enough for founders to have ownership and possession
- Smaller board sizes are ideal for alignment, but small size means they can oppose management if conflict arises
- Board of three ideal, not to exceed five - but public companies must follow government mandates for board size
- Everyone should 100% commit to firm (stock options, regular salary), exceptions include lawyers and accountants
- Consultants, part-time employees, etc biased to claim value in near-term and not future company growth
- Startups often do better the less they pay the CEO, *under $150K* is ideal otherwise they’ll favor status quo
- Low CEO pay sets standard for everyone else, emphasizing non-cash compensation emphasizes long-term growth
- Equity should not be *equally* distributed, it’s arbitrary and doesn’t reflect individual differences/circumstances
- Not possible to be 100% fair with equity allocation, early employees risk more, keep ownership stake secret
- Equity is tied to a specific company and the growth of that company over time, dedicated people will prefer it
- If you get the founding moment right, you can go beyond a valuable company and beyond inherited success

10. The Mechanics of Mafia:

- Company culture should not be reducible to just the absurd perks that Silicon Valley firms are known for
- **Paypal Mafia:** All later founded/co-founded companies worth over a billion each

    1. **Elon Musk:** SpaceX and Tesla
    2. **Reid Hoffman:** LinkedIn
    3. **Steve Chen, Chad Hurley, Jawed Karim:** YouTube
    4. **Jeremy Stoppelman, Russel Simmons:** Yelp
    5. **David Sacks:** Yammer
    6. **Peter Thiel:** Palantir

- Paypal didn’t sort through resumes and find most “talented” people as their sole hiring strategy
- Companies should strive to hire people that will have long-term prospects with each other even outside the firm
- Do not outsource recruiting, it’s a core competency for any company and people need to be cohesive after hiring
- High-skilled employees have plenty of options, you must find reasons that distinguish your firm from others
- Reasons often boil down to the company mission and the team seeking to carry it out, answers will vary by firm
- Do not fight the perk war, you can’t be the Google of today by that standard, but you can aim for Google of 1999
- Everyone in a company should be different in the same way, early staff should be as personally similar as possible
- Everyone should be especially focused on one particular thing, roles must be well-defined to reduce conflict
- Startups are vulnerable to task conflict because roles are often more fluid, eliminate that competition
- Cults are pure dedication, consulting firms are the opposite with no distinctive mission, startups closer to former
- A cult is *wrong* about something crucial while people at a startup are *right* about a secret but important truth

11. If You Build It, Will They Come?

- Distribution matters, you can’t expect to rely entirely on building a product that sells itself
- US ad industry in 2014 had an annual revenue of $150 billion and employed over 600,000 people
- US sales industry is even bigger at $450 billion and with 3.2 million employees, engineers skeptical of need
- Engineers skeptical of advertising because they think it’s irrational, but it matters because it works
- Sales is less transparent than engineering, sales is about changing appearences but not underlying reality
- Salesmen are actors focused on persuasion, we typically focus on the awkward obvious salesmen for bad rep
- Sales works best when hidden, and most people involved have job titles that don’t seem related to it

- Path dependence: specific circumstances can lead to one product winning over another regardless of quality
- Better sales and distribution can lead to monopoly even without product differentiation, but not vice versa
- **Two metrics help shape effective distribution:** Customer Lifetime Value > Customer Acquisition Cost
- **Complex sales** (to big firms, governments, etc) can take months to make right relationships, infrequent (SpaceX)
- With complex sales, salesmen are usually not a set role and someone such as the CEO communicates with clients
- Must start with reference customers at smaller scale before approaching bigger clients
- **Personal sales** bring the question of moving a product to an audience, often starting with niche users
- Products themselves can be a form of distribution for a service, value increases with network effects (ZocDoc)
- Deadzone between personal sales (salespeople needed) and advertising (no salespeople), can't talk to *every* client
- **Advertisement** is best for low-cost goods with mass-appeal but lack methods for viral distribution
- Such a thing only good for startups when CAC and CLV make other distribution channels too costly to pull off
- **Virality** for distribution means each new customer for a product necessarily means multiple new customers too
- PayPal started w/24 users (all employees) , paid customers for referrals: $20/user, 7% daily growth, 2x/10 days
- Power law applies to distribution strategies/channels, most firms don't get any to work, poor sales not product
- Selling company to media is necessary part of selling it to everyone else - including investors/employees

12. Man and Machine:

- Computers as complements to humans, most valuable firms will try to empower people rather than make them obsolete
- Tech advancement isn't like globalization: people compete for jobs/resources, machines compete for neither
- Trade gains biggest when big discrepancy exists in comparative advantage, entry-level workers don't fit this mold
- Man and machine good at different things, intentionality with former and large scale data processing with latter
- 2012, Google comp (16,000 CPUs) 75% accuracy identifying cats (ten million photos), worse than kid
- New tech like comparatively hyperspecialized trading partner, don't have to compete with it for resources.
- With PayPal fraud analysis, automated solutions worked *temporarily*, perps would catch on, adaptive enemy
- Human analysts weren't as easily fooled, program rewritten to flag suspicious activity, human makes final call
- Hybrid approach later led to founding of Palantir, focused on terrorist networks and financial fraud, FBI interest
- LinkedIn also takes this hybrid approach, it doesn't try to completely replace recruiters in all respective tasks
- Computer science too high a focus on trying to reduce human capabilities to tasks that can be replaced entirely
- Computers find patterns that humans can't, weighing importance of patterns from different sources, etc not so
- Indefinite fears about strong AI should not be used to justify making definite plans for the present and near future

13. Seeing Green:

- 21st century green bubble, over $50 billion poured into green startups, Solyndra noteworthy example of failed firm
- **Most cleantech firms failed because they neglected one or more of the following:**
    1. Engineering: *breakthrough not incremental*
    2. Timing: *circumstances for market of firm*
    3. Monopoly: *big share of small market*
    4. People: *right team*
    5. Distribution: *product delivery*
    6. Durability: *future market dominance*
    7. Secret: *opportunity others don't see*
- Engineering breakthrough should be 10x, most cleantech never exceeded 2x, no big enough difference to end users
- Solar was *not* like microprocessor industry, the latter advances exponentially while solar was more linear at best
- Slow-moving markets are only worth entering if you have a plan to take it over, cleantech firms failed to do this
- Energy markets are extremely huge, anyone who enters is going to face heavy competition, a need to differentiate
- Solar market is a big pond, across countries, and to end users not that different from other energy sources
- Most energy companies were not run by technical teams, primarily from suit/tie individuals, not outside the box
- Cleantech places way too big a focus on rent-seeking instead of the actual customer base they claimed to be serving
- One electric car company went out of business, they weren't unique (wasn't clear you were buying anything new)
- None of the cleantech firms that went out of business took durability into account, esp two key competition sources
- There were no major secrets with solar for any of the firms to distinguish themselves by, all had the same vision
- "Social entrepreneurship" suffers from the problem of conflating *good for society* with *seen as* good for society
- Doing something different is the most reliable way to achieve something good for society
- **Tesla:** achieved all seven in a manner that other firms were unable to/didn't bother to duplicate:
    1. Tech good enough that other firms rely on it (creating more market overall)
    2. Tesla secured DoE loan when it was available and prior to the bubble bursting
    3. Market was small (electric sports cars), easy to dominate and expand from
    4. Team is both engineering-focused and good at marketing/sales
    5. Tesla owns the entire distribution chain, control over customer experience
    6. Durability of the company stems from head start + faster growth + strong brand
    7. Tesla's secret was that cleantech needed a "look cool" imperative, not just intent
- Cleantech bubble has many similarities with the dot com bubble (market growth, lack of distinction among firms)

14. The Founder’s Paradox:

- It’s more powerful, yet more dangerous for a firm to be run by a distinctive rather than interchangeable person
- Most founders follow an inverse distribution, few are *average* in a particular trait or stay that way if they are
- Founders are unusual in may ways to begin with, but also become more unusual in certain respects as time goes on
- Founder “types” have been around even in myths, praised for prosperity but blamed for misfortune *[how prescient…]*
- We worship and despise founders the same way we worship and despise celebrities
- Steve Job’s return to Apple after 12 years of “professional” mismanagement indicates value creation isn’t simple formula
- General lesson from successful firms: We need founders, and tolerance of founders who are strange or extreme
- As afounder, you must understand your own power as an individual and do what you can to bring out the best in others

Conclusion: *Stagnation or Singularity?*

- **Scenarios:** recurrent collapse, plateau, extinction, takeoff
- Recurrent collapse unlike due to how widespread knowledge about civilization is
- Extinction means there’s no future to consider at all, but likelier than plateau for competitive reasons
- Takeoff, or singularity, is the last of the four scenarios - it won’t happen on it’s own without going from 0 to 1