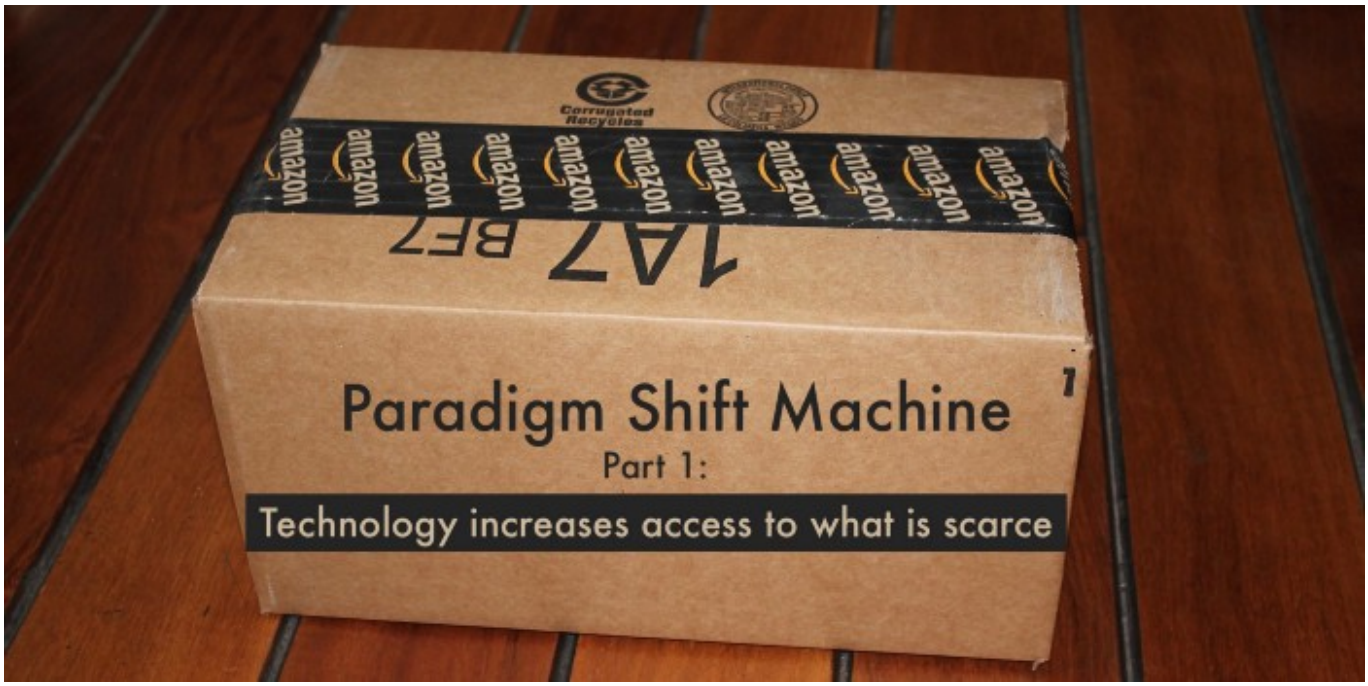
Paradigm Shift Machine, Part 1: Technology increases access to what is scarce

Alex Danco Follow
Jul 31, 2016 · 15 min read



Hello! If you're coming here for the first time, thanks for checking out my writing on Medium. I don't publish much here anymore — I've switched over to publishing entirely on my own website, alexdanco.com. I also write a weekly newsletter which comes out on Sundays, you can sign up at danco.substack.com. I write a lot, and I don't want you to miss it! So please head over there and subscribe.

• • •

There is something strange and special about software and the Internet that would be

hard to explain to a time traveling industrialist from a century ago:

-It's very powerful and high leverage in an unprecedented way. Billions of dollars of real enterprise value can be created by a few dozen or hundred employees. Over a billion ordinary people now have access to a tremendous amount of leverage that they never could have imagined a few decades ago.

-It's tremendously hard to predict. Many of the great tech companies today started out doing something else, or exploded onto the scene after a series of happy accidents. Even the best capital allocators in the business acknowledge that for every home run, you're going to get a bunch of strikeouts — no matter how smart or capable you may be. And many of the great technology companies fall astonishingly quickly — and years later, we'll still be arguing over how and why.

-"Everything you know is wrong" syndrome: if we're not constantly on our toes, our mental models of how things work will go out of date astonishingly quickly. A leading indicator metric, customer acquisition technique, or strategic roadmap can go obsolete so fast, we have to continuously think critically about new ones.

Why? Why is today's tech industry so difficult to understand and predict? Is there a reason for this?

The modern tech industry we've created can be thought of as a *paradigm shift machine*. It's an industry whose core process is replacing the scarce resources of other industries (and of itself) with new ones, and in doing so, rearranging their business models and ecosystems.

Understanding the paradigm towards which we're moving and the scarce resources at play is the single most important thing you can do to win. If you get them right, you will be able to fail fast, learn faster, and build products naturally find demand. If you get them wrong, then nothing else will matter: you'll learn false lessons, interpret signals incorrectly, and ultimately be left behind — no matter how featured your product or detailed your strategy.

This series of posts will present a way to make sense of paradigm shifts in tech by understanding the identity of the scarce resource and how it changes. In part 1, we'll learn the concepts in general and look at some historical examples. In parts 2 through 4,

we'll look in greater detail at three shifts taking place today: Snapchat, A/VR & new media; Uber & transportation; and finally Tesla & energy.

. . .

First of all, let's establish some working concepts. There are many ways one can define "technology": as tools that do work, as a body of knowledge, as a hierarchy of functioning parts; and other perfectly usable definitions. Here's mine: **Technology is something that increases access to a scarce resource.** Whether that scarce resource is something vital (irrigation, refrigeration, or antibiotics) or something pleasurable (cable TV, airfare to the beach, or Instagram), technology is what makes these scarce resources available to 10 times the people at half the price. This is nearly always a good thing for the world: when we expand the pool of people who have access to a resource that is scarce, and allow them to participate in the benefits of what is scarce, then our economy and quality of life both prosper.

If technology increases access to scarce resources, then what are scarce resources? Identifying scarce resources in an ecosystem is a critical skill. Think about an industry, and then try to identify what *compromises* or *grand bargains* are being made when the industry is at equilibrium. The compromises or bargains are typically between two or more centers of gravity, each defined by its own scarce resource. As I've written about before, profit is ultimately made off of some point of friction related to a scarce resource: good executives in an industry are those who really understand the ins and outs of scarcity, and can put their companies into positions where they own something of value. In a heliocentric world, the scarce resource is the sun.

For instance, let's consider the traditional consumer packaged goods industry. Two scarce resources have historically underpinned the principal negotiation between wholesalers and retailers: shelf space and brand power. Stores use their shelf space (and its underlying real estate, supply chain, and more) as a way to negotiate wholesale rates; great retailers like Walmart understand this very well. Suppliers in turn use their brands (and their underlying R&D, customer empathy, and more) as a way to negotiate better shelf space; great companies like P&G do this very well. The industry is at equilibrium.

To consider another complex ecosystem, think about the some of the grand bargains involved in the automobile industry. Making cars is difficult — the ability and capacity to actually design, build and ship a functioning automobile is fairly scarce. Likewise, cars are expensive — the ability to put together the cash or consumer credit for a vehicle purchase is also scarce. There are other important centers of gravity as well: gas station infrastructure must exist. Roads and parking lots must be paved and maintained. Overall, there is a "multi-stakeholder grand bargain" of sorts between all the major parties: "I'll pledge to continue investing and building cars if drivers pledge to keep buying them, gas stations keep operating, and the state maintains a good road system and continues to pass car-friendly laws." If any components of the bargain were to fall apart, things get weird. (We'll talk about this in Parts 3 and 4.) But there are strong forces holding the bargain together, so it does — mutual interdependence is a strong motivator to preserve the status quo.

Now, think about what might happen when "technology", whatever it may be, increases access to those scarce resources. Most of the time, technological R&D successfully increases access to a scarce resource as intended, yet the identity of the scarce resource nonetheless remains the same. We get incremental, but not fundamentally disruptive, improvements to the way things work. No major paradigms or business models get rearranged, and overall it feels like a win-win for everybody.

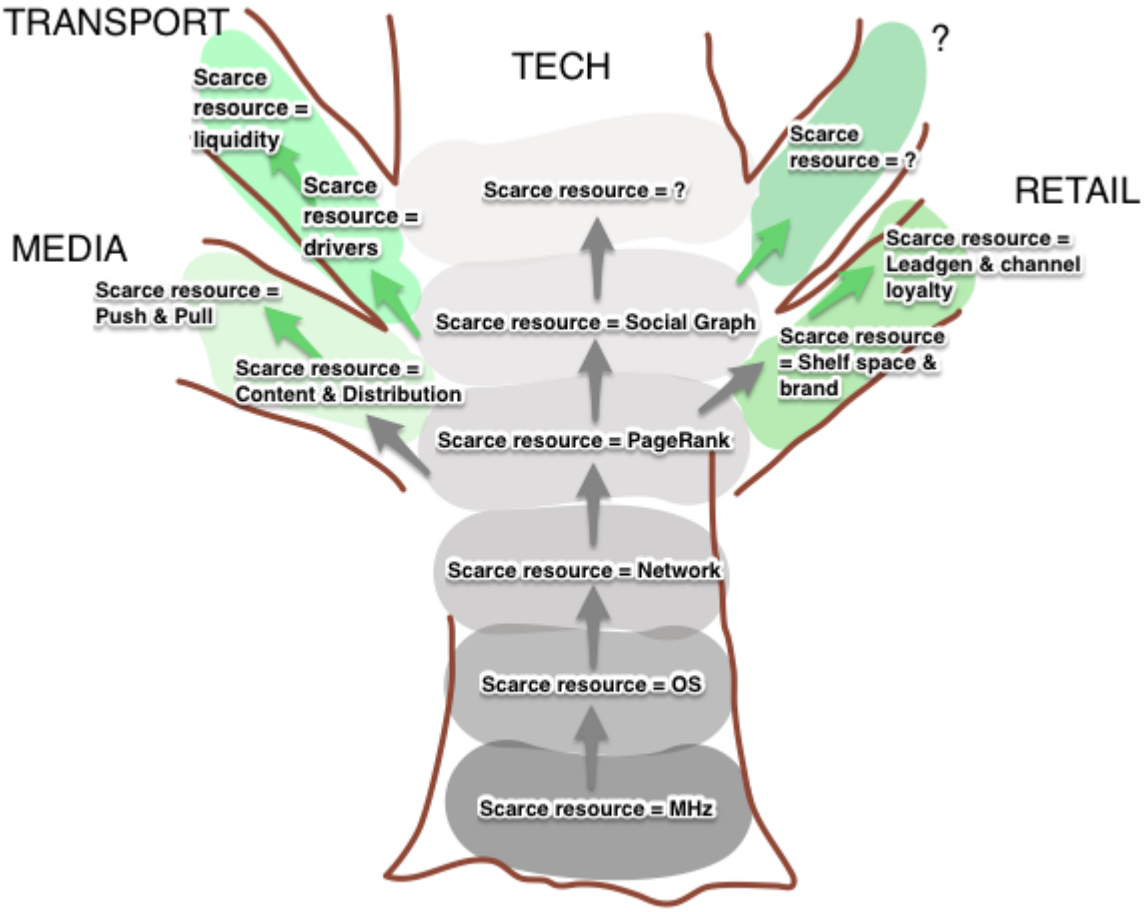
But sometimes, something different happens. There are some kinds of technologies which increase access to a scarce resource to the point where that resource is no longer scarce at all. The identity of the scarce resource changes: something new emerges as valuable, somewhere else, and it often isn't obvious what or where for some time. This is the "paradigm shift" we've talked about.* Until recently, these shifts were somewhat uncommon: the identity of scarce resources changed only occasionally, and when they did they were quite monumental (the advent of modern farming, the printing press, the industrial revolution, and so forth). But something new and different is happening because of software and the internet: these paradigm shifts, where the identity of the scarce resource changes, are happening much more frequently.

Why?

Consider what software + the internet really are at their core. They're *Instructions* and *Reach*, with a "Triple Zero" set of qualities: zero marginal cost of production, zero

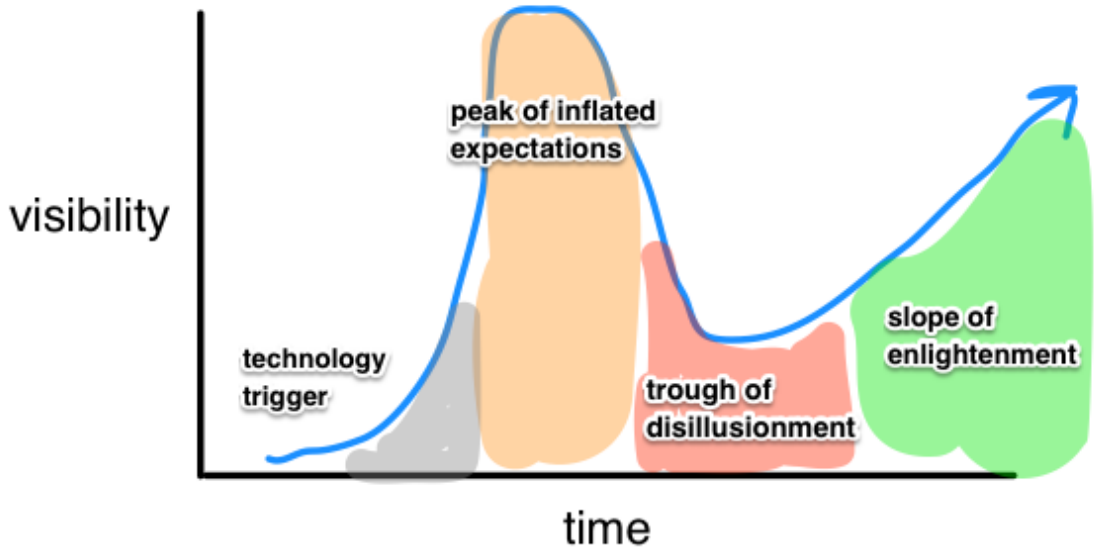
friction of distribution, and zero latency of updating. They are building blocks for technologies that rearrange business paradigms. We call these building blocks "The tech industry" — a tree trunk of instructions and reach that increase access to scarce resources — not incrementally, but radically.

This tree grows in two ways: by spreading out into adjacent industries, transforming the identity of scarce resources as it invades, as well as by recursively growing and transforming *itself* over and over (with the newest scarce resource evolving each generation of tech). The principal trunk grows very fast — a new paradigm (and dominant $100B tech company) has anecdotally emerged every six years or so, fairly reliably, over the last few decades. The branches growing out into other sectors of the economy tend to take a bit longer; this makes some sense, as the business models and paradigms under transformation are decades or centuries old.



If you really zoom out and put on your creative glasses, the growth of the tech industry almost feels like a fractal equation, growing ever-larger in a self-similar way: whether

recursively transforming itself, or branching out into the periphery. This isn't a totally new observation — technology as a concept has been described in recursive, self-similar or fractal terms before. But I'd like to highlight an aspect of this recursiveness that fits together with another observed phenomenon quite nicely. Each time a transformative step occurs — i.e. when the business paradigm flips — the impact on the market rhymes with its predecessors to a remarkable degree. We have a name for this, especially for when we talk about tech's impact on peripheral industries: we call it the Gartner Hype Curve, or alternately just the Tech Hype Cycle.



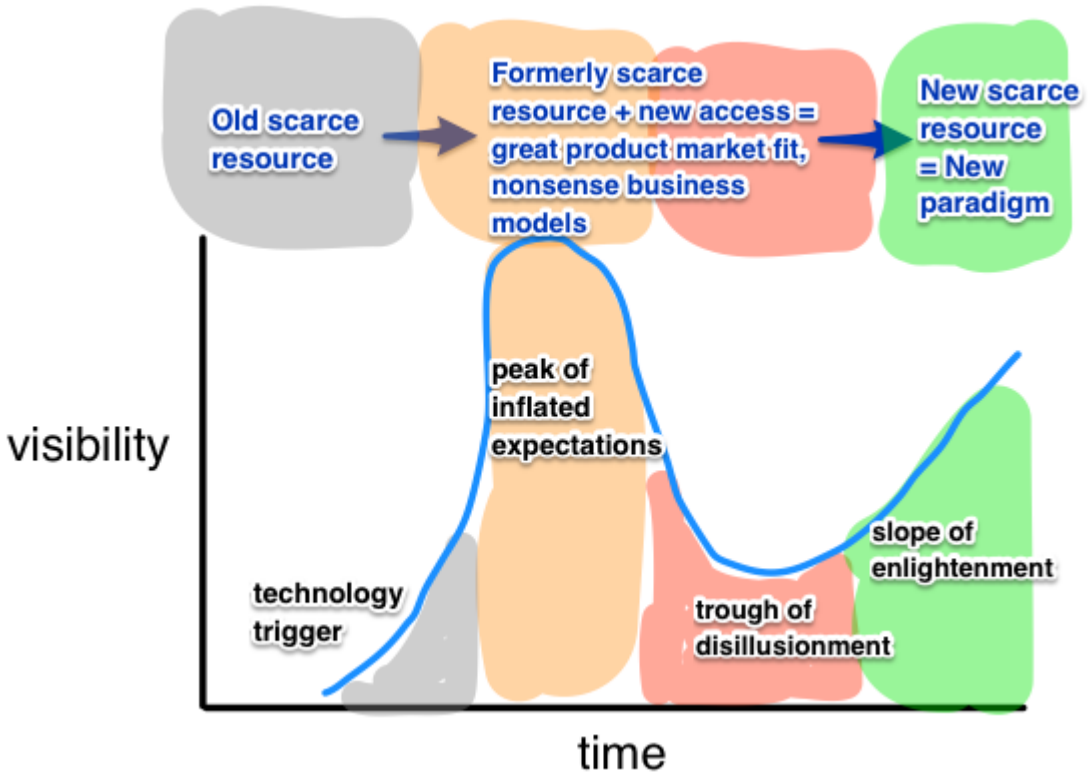
This well-documented curve has been very discussed over the years, and an obvious question comes up consistently — *why does it happen?* One answer offered frequently is "At the beginning, the tech just isn't ready yet — expectations are inflated, and the products are immature." I don't really like this answer — I feel that there is often something else going on. Yes, hype is partly driven by inflationary promises from those who are incentivized to do so — and startups, investors, and the media are all a little guilty from time to time. But I think you'll notice something else too. At the peak of the hype curve, the business models we encounter are flawed *in a consistent way*.

I believe the real answer has to do with the changing identity of the scarce resource:

- At the beginning, there's some scarce resource that everybody understands, around which the industry is organized.
- At some point, a new kind of technology appears that radically *increases access to the scarce resource*. People get very excited about what amazing new opportunities and products are now possible. You hear a lot of talk about how this new access "solves a pain point"; lots of new startups get funded and they see huge spikes of page views, GMV, and other early signs of interest.
- However, what has in fact happened as a result of this new technology is that the formerly scarce resource is no longer scarce at all; the point of friction around which profit was extracted no longer exists for these new use cases. The old business paradigm + the new increased access *does not work as a business model*. You can make compelling features and products, but you can't make money!
- Yet, these businesses who merge the old scarce resource with the new kind of access seem to emerge everywhere, like weeds. Why? There is a reliable flood of what feels like Product-Market Fit resulting from this new access, corresponding to the peak of the curve where everybody decides they want to build and fund these ideas. Of course, that window doesn't stay open forever. After enough funding rounds, people get wise to the fact that these businesses are having to work harder and harder to earn an incremental dollar of profit — or even to break even. This is not what software business models are supposed to do!
- We then enter the "trough of disillusionment" phase of the hype curve. This curve is traditionally explained as the point at which we realize the tech isn't ready. But as you can see, really what's going on is we've collectively realized that the old scarce resource + new access does not make a good business model. It's a shame, because some of these products are really neat! But they're too early. The scarce resources around which things will be organized haven't been found yet.
- Some time later, whether deliberately *or by accident*, somebody identifies the new scarce resource that has emerged and figures out how to own it. They understand the new paradigm, the wind is at their back, and their product rips through the market. This time, the business model really works: they may burn cash for a short

period time, but rapidly rocket up the "J-Curve" of profitability, and don't need to struggle or slash costs to break through to cash-flow positive. These companies turn into dominant forces for years to come, cementing their position as the category leader of their layer of the tech stack. (I talked about this core ladder of companies in Emergent Layers, Part 1.) The intricacies of the actual businesses, trades, breakthroughs and deals made are often lost or misunderstood with time. But hindsight is 20/20: we can see what is scarce in retrospect, and see clearly whom has mastered it.

- (You'll also note that I've left out the "Plateau of Productivity" phase of the traditionally drawn Hype Curve. This is on purpose: I don't think there's ever a real plateau of anything, because ultimately we move onto a new scarce resource and the question of whether or not the plateau persists becomes a moot point.)



Let's work through some examples.

First of all, consider the media industry — the first major piece of the world's economy to be completely transformed by the modern tech industry. Traditionally in media, there were two points of industry friction: content and distribution. From the age of newspapers through radio and TV, although technology has evolved, the grand bargain

has been the same: those who created content negotiated with those who distributed content, who in turn negotiated with advertisers. (You could most likely grab a newspaper exec and drop them into a radio or TV station, or even a record label, and within a short time they'd know their way around.) Then came the web, and everything changed: on the internet, there are an infinite number of channels and no limit to the amount of content created or discovered! The formerly scarce resources, content and distribution, were no longer so. But in the amped up part of the curve, everyone was excited: that's how we ended up in 1999, with bombast like the AOL/Time Warner merger promising "A union of old and new media that would dominate the world".

Of course, it didn't work out that way. The big old/new media fusion portals were largely busts, with AOL/Time Warner as a representative example: Time's media properties remained top class, but their old-world scarcity mixed with AOL's new-world access did not work as a business. It took several years before we figured out what the real new scarce resources were. They were "pull" and "push": the ability to own someone's active searching intent or destination (with Google the biggest winner) and passive consumption interest (with Facebook the biggest winner). Many new, successful media companies have emerged that all own interesting combinations of pull and push: Netflix, Youtube, HBO, Soundcloud, and Buzzfeed all come to mind. Ultimately, they're organized around the correct scarce resources — they get the paradigm right, and have the wind at their backs accordingly. (We'll look at this in detail and consider what happens next for media in part 2.)

Let's examine a second example: retail. As I mentioned before, in retail there have traditionally been two principal scarce resources: shelf space and brand power. Whether you're a small corner store or a giant supercenter, these scarce resources are still the principal ones off of which money can be made. Then came the Internet, and everyone naturally got very excited about e-commerce. Of course, we now see in hindsight that the business models of these early e-commerce players made it very hard to turn a profit: even Amazon.com, "The Everything Store", found itself in a position where it could drive prices down very effectively but had a much harder time generating a profit without compromising its core values. New access + old paradigm = bad business models, which were exposed and broadly left for dead in the dot com crash.

What turned out to be the correct model? It looks like the Amazon of today: a very differently geared company than the one of the 90s. As it turns out, when shelf space is infinite, what really matters is lead generation and customer loyalty. Amazon captures this brilliantly through Amazon Prime, which sits on top of a Marketplace — Basics — Fulfillment equilibrium where Amazon either takes a tax as Marketplace broker, or sells its own branded products through Basics. (Or Kindle, or Amazon studios, and others.)

It's worth repeating how important this is: Amazon has been able to re-gear its business as one where it can force prices ever lower while reinforcing its take-rate, because it owns the scarce resource: Prime. Furthermore, due to the overwhelming customer loyalty fostered by Prime, Amazon has developed considerable leverage over the old brand names — with the recent news over their Dash Button fees as one of many examples. Indeed, those same brands have responded by building new channel-loyalty machines of their own, as demonstrated by Uniliver's recent purchase of Dollar Shave Club.

It's been observed by Paul Graham and others that "it's a lot easier for a software company to learn to build X than for an X company to learn to build software." I would agree that this is true. Talent aside, it may have something to do with scarce resources. The tech industry is very used to dealing with scarce resources that change, and is natively tuned to the fact that the real value to be captured is in the disruption of an old paradigm and creation of a new one. Other industries? Not so much. This core competency of the tech industry is particularly powerful given that it's not a characteristic of any one of its component companies, but rather of the Silicon Valley ecosystem itself. Over the next few years, as tech takes on even more difficult challenges like education, energy and health care, we'll see if this observation continues to hold true.

. . .

Before we examine some specific industries in parts 2 through 4, what are some lessons we can take away?

1. It seems to me like we (the tech industry, and VC crowd in particular) don't spend enough time questioning whether we understand paradigms and scarce resources

correctly. Here's the thing: if you you get the paradigm right, you're allowed to make a lot of mistakes, because you'll learn from them very quickly. But if you *don't* get the paradigm right, then you won't learn the right lessons! "Fail fast, learn faster" is only truly useful information if you understand how things are arranged — otherwise you'll draw the wrong conclusions.

2. Why do we seem to make the same mistakes at the peak of the hype curve so consistently? Why do we fall so repeatedly for these same kinds of businesses — who marry the old paradigm with the new access, creating companies that look compelling but have non-functional business models? It may have something to do with our obsession with "product market fit". If you're at the point of the hype curve where access to the previously scarce resource is newly liberated, but you *haven't yet identified the new one*, you may well build a product with great appeal to customers — Lots of page views! Lots of GMV! — but little lasting business value. To paraphrase the common saying, "If you're sitting at the table with your customers, suppliers and partners, and you don't *really* know what the scarce resource is, then you're the sucker."

3. In *Zero to One*, Peter Thiel challenges us with the question: "What valuable company is nobody building? Every correct answer is necessarily a secret: something important and unknown, something hard to do but doable. If there are many secrets left in the world, there are probably many world-changing companies yet to be started." Understanding how scarce resources change, and recognizing new paradigms before they're obvious, may be key to identifying the types of secrets Thiel talks about. After all, new scarce resources and paradigms — the next Microsoft, Google, or Uber — hide in plain sight. Quite a few people *could've* noticed in 1978 that the software industry was poised to exist yet didn't — but Bill Gates and Paul Allen *did*. And, to be truthful, of all of the asymmetries that drive change and profit, one of the biggest that can possibly exist is the asymmetry between those who identify the next scarce resource and those fighting over the last one. Both parties may hold the exact same information, but only one recognizes the future, hiding in plain sight.

In Part 2 next week, we'll take a look at the shift in scarce resources underway once again in media, think about what Snapchat and A/VR really mean, and make some guesses about what will become valuable in the future.

You can find Part 2 here:

From Pull and Push to Here and Now: the grand bargain of Facebook is unraveling. What comes next? Paradigm Shift Machine, Part 2

. . .

Thanks for reading. If you're enjoying this series, please share with anyone who might be interested. We'd also love if you subscribed to Snippets, our weekly newsletter from Social Capital (curated by me) featuring our current observations, links to what we're reading, and news from the great companies we work with.

**This idea here of paradigm shifts is described to some extent, albeit worded differently, in Clayton Christensen's Law of Conservation of Attractive Profits. Where my way of looking at things differs from Christensen's, however, is the following: his law considers an existing value chain, and asserts that when one part of the chain transitions from being integrated to modular, a new opportunity for integration appears at an adjacent stage. I think this is correct, but I'd add that sometimes our concept of what the value chain even is in the first place can shift radically upon the emergence of a new scarce resource. In hindsight, we can always think of it as a rearrangement — but at the time, it feels like something brand new and ill-understood is going on.*

Thanks to Ashley Mayer, Jonathan Hsu, Nikhil Krishnan, and Jay Zaveri.

Tech Technology Startup Venture Capital Social Capital Posts