Emergent Layers, Chapter 4: Some Speculation About the Future

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This is the final essay in our Emergent Layers series at Social Capital. To start at the beginning, please head here.

In Part 1, we looked at the Scarcity > Abstraction > Abundance cycle and how it creates the new layers of technology in column i that move us forward.

In Part 2, we examined the nature of the overserved and underserved customer in column j, and how it creates conditions of explosive demand.

In Part 3, we put column i and column j together, and examined companies retrospectively through this framework to see how it generally fits together.

In this final section, we're going to do a little bit of speculation about the future, and see how it might fit into this i/j framework without contorting anything too badly.
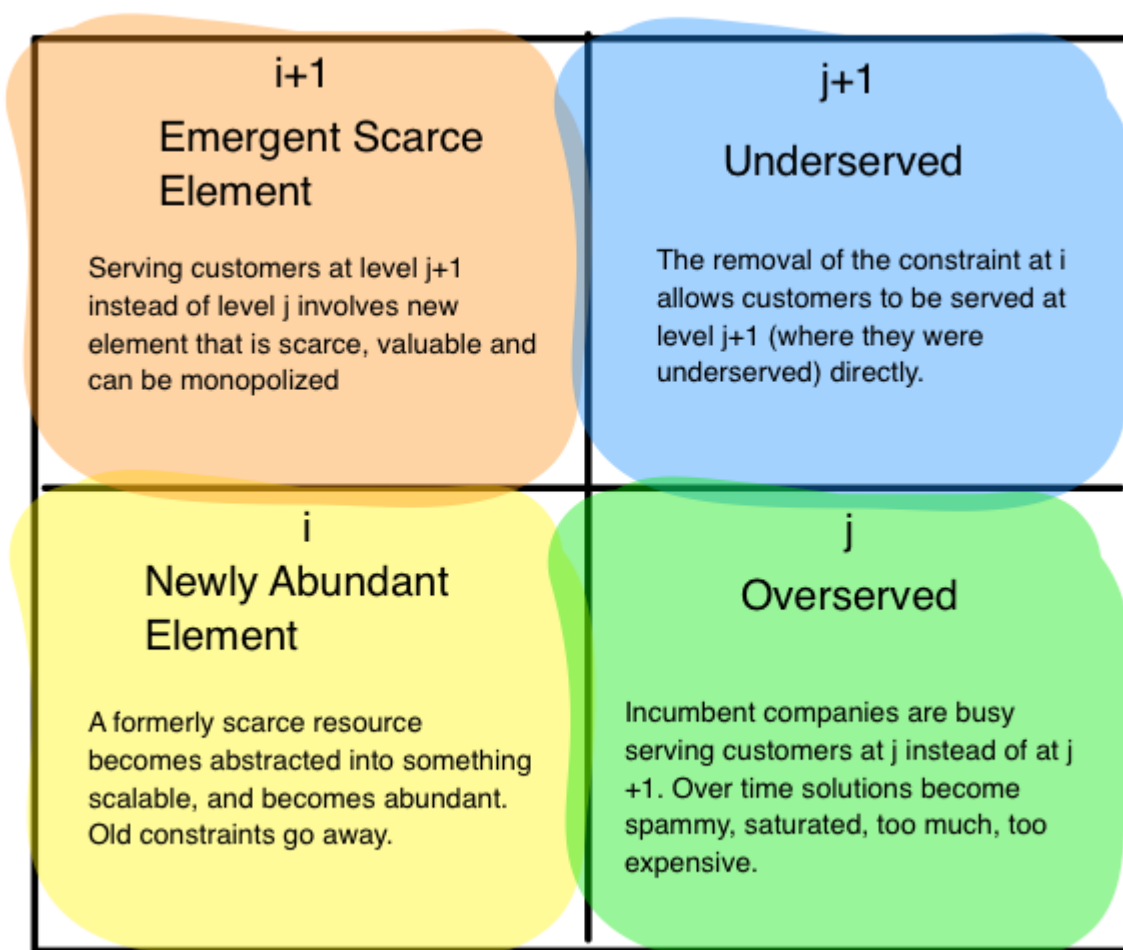
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Going way back, we can see how humans have created new value through abstraction since the very beginning of time:

-Basic safety and food requirements became abstracted into the communal tribe, allowing us to do more new things.

-Communication with one another became abstracted into language, allowing us to do more new things.

-Assisting and trading with one another became abstracted into currency, allowing us to do more new things.

-Human and animal muscle became abstracted into steam, gas and electric power, allowing us to do more new things.

-Our daily cognitive work (and much more) became abstracted into a network of intelligent machines, allowing us to do more new things.

More recently, within the modern day technology stack:

-Computing power became abstracted into the programmable chip, making it abundantly available (and Intel a lot of money)

-PC hardware became abstracted into software, making it abundantly available (and Microsoft a lot of money)

-Network participation became abstracted into all-purpose gear & protocols, making it abundantly available (and Cisco a lot of money)

-Indexed comprehension of the contents of the internet was abstracted into PageRank, making it abundantly available (and Google a lot of money)

-Humans connecting to one another was abstracted into the social graph, making it abundantly available (and Facebook a lot of money)

This process can be visualized and understood using our i / i+1 / j / j+1 framework as such:

i+1 **Emergent Scarce Element**	j+1 **Underserved**
Serving customers at level j+1 instead of level j involves new element that is scarce, valuable and can be monopolized	The removal of the constraint at i allows customers to be served at level j+1 (where they were underserved) directly.
i **Newly Abundant Element**	j **Overserved**
A formerly scarce resource becomes abstracted into something scalable, and becomes abundant. Old constraints go away.	Incumbent companies are busy serving customers at j instead of at j +1. Over time solutions become spammy, saturated, too much, too expensive.

Why does this work? What makes column i and column j fit together to the extent that they do? The most important mental leap to make, I believe, is grasping the connection between *scarcity* and being *overserved*. This seems counterintuitive: why am I overserved in an environment governed by something scarce? Shouldn't it be the opposite?

When a resource is scarce, and everyone knows it's scarce, people and businesses will treat it as such — a scarce resource means a point of friction, and points of friction offer the potential to make money. Recall our friend Giaccomo in Chapter 1, who made money off of a geographic point of friction. Were his customers underserved, or overserved? The answer is both! Because music is a non-scalable entity at that point in time, they have no choice but to hire an entire real-life person to entertain them — an over-service. (Of course Giaccomo didn't mind — it's how he made his money.) They're also underserved on selection — they're stuck with Giaccomo and his friends as their only options. With the advent of the phonograph and the abstraction of music into a scalable entity, a scarce resource became abundant and the critical element of performance shifted from the overserved to the underserved quantity.

Let's go back and look at the evolution of the stack up until now:

Circuits > Bits > Machines > Networked Internet > Indexed web > Social / mobile > (current) > ?

What scarce resources are in the process of of becoming abstracted away into abundantly available and scalable entities? I'd say it looks something like the following set:

[Cloud — Mobile — Social]

Cloud computing is in the process of becoming an abundant resource, being abstracted away by AWS, VMware, and others.

Mobile is now ubiquitous and everywhere, having been successfully abstracted away by iOS and Android. We see an interesting bifurcated distribution where iOS gets the fancy people, Android gets everybody else, they both win, and the handset dinosaurs lose.

And finally, Social connectivity is now abundant and everywhere, and Facebook has won.

If you project forward, and look at what everybody's building, we can map a lot of it across a spectrum as follows:
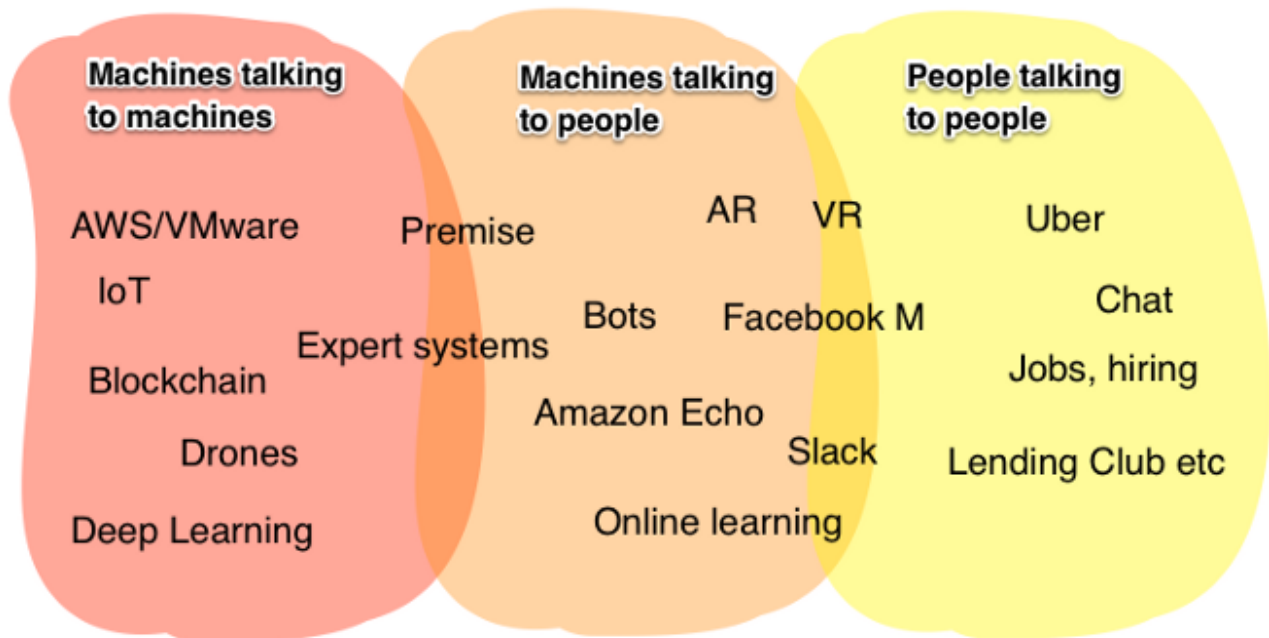
Of course not everything fits perfectly onto this landscape, and there are other promising fields of innovation that are largely elsewhere (e.g. what's going in biology). But generally speaking this seems like the overall direction we're headed.

So the questions that we can ask here are: what are the new scarce resources, how might they be abstracted in a way that makes them abundant, and then what new scarce resources will emerge out of that? Could we possibly be at a branching point, where distinct "branches" of tech each grow off in different directions while being built on the same underlying trunk? How will the branches relate to each other? And finally, what existing incumbencies and power structures will be rearranged as a result of these transitions?

In the cloud arena: if AWS is poised to be the next version of Intel, who is their Microsoft? It's still the early days of cloud, and it's hard to know which of these two outcomes will happen: if it'll go like Intel, where one company was able to get a

dominant market position when assembly language all got standardized on top of their stuff, or if it'll go like the wireless carriers, who spend trillions in Capex only to find themselves becoming largely interchangeable dumb pipes supporting Apple's money printing engine. Furthermore, as the internet starts to go inside everything (not just "your washing machine talks to your thermostat", but also more wide-scale industrial applications), you're just going to get a lot more things computing a lot more numbers, everywhere, all the time. So if cloud computing and "internet inside everything" is becoming abstracted away into abundance, what is now scarce? Where are people becoming overserved?

One possible position is that machines are becoming overserved in their ability to speak to one another but not yet truly able to *trust* one another — for now. (We don't really have a system in place to handle these kinds of things yet. I'm not sure most of us know the right questions to ask.) Machines can talk to other machines through API calls and other standardized interfaces, but it's formalized in a way that's akin to how a group of humans who don't know each other at all might interact. This may change in the near future, particularly as distributed networks of machines begin to carry out tasks that involve uncertainty (driverless cars being a prime example, and there are surely other huge industries of the future that will run this way).

Next up, let's look at mobile. It's been clear for a little while now that bloated app stores full of garbage and spammy content are not going to be a permanent model for new value creation going forward. But what is? What's the next scarce resource, and how is it going be abstracted away and made abundant?

I think we're seeing some major clues with the Amazon Echo: it really feels like an abstraction of many of the ways we use our phones that are feeling overstuffed, saturated and continuous. If you read what people are saying about it after living with Alexa for a little while, you hear a lot of comments like: "Not having to handle your phone around the house is refreshing. Faster decisions. Less mental overhead for morning and night exit-entrances." That sounds super promising. The scarce resource at play here is actually a kind of human-machine trust: "Less mental overhead" essentially means we've successfully abstracted away something that was previously scarce — our ability to depend on and trust a machine with some very important elements of our day to day life! That's profound. If we then think about this newly scarce resource — human

to machine trust — in the context of everything else we're building here — Facebook M, Bots, VR/AR, Online learning — there are some pretty cool implications.

And finally, how about social? What's the next scarce resource, and how is it going to be abstracted away and made abundant?

Here, once again, the emergent scarce resource is trust. And the elephant in the room is Uber. Forget about transportation for a minute — what makes Uber so profoundly interesting is the fact that abundant connectivity to one another makes it so that I can trust and depend on someone else's time and resources as if they were my own — Uber is beginning to abstract away trust, and that's what makes it work. Something similar is occurring with chat: with a new generation raised on chat now all grown up, we find it far more comfortable to interact with other people (particularly by text) than before. Many of the promises of the on-demand economy are built on this idea — if the internet and social graph acts like a collective trust broker, all kinds of new and more efficient business models are possible. Sometimes it's worked, other times it's been a let down. But either way, trust emerging as the central new scarce resource out of abundant social connectivity seems to make a lot of sense.

So, really, across these three categories — Machines talking to machines, machines talking to people, and people talking to people — a central theme that has emerged across all of them. It seems to be trust of some kind: machines trusting other machines, humans trusting machines, and humans trusting other humans.

How does this become abstracted successfully?

P2P: We're already seeing Uber and friends (Airbnb et al.) accomplish this for granting others access to assets, like your time/vehicle and your house. I've written about this previously in The Access Economy, where I go through why I don't like the term 'sharing economy' (If it feels like sharing, you're doing it wrong) and where I think this is all headed. Another interesting story is what happens when this idea of abstracted trust in a social context as it pertains to credentialing more broadly. Currently, the way we find jobs and work for money is organized around constraints that largely go away when trust and credentialing become abstracted and abundantly available. There is most likely going to be some sort of rearrangement of power hierarchies around credentialing in general — from education on upwards — so this is the shift to watch. Since ultimately

what matters is a human's ability to trust another human, one potentially correct thing to fundamentally organize around is chat — or something like it. What does creating new value mean here? With social trust completing an abstraction to abundance at level i, what emerges as newly scarce at level i+1?

M2M: How does a machine trust another machine? What does that mean? In this case we also have an early front runner, at least in the intellectual sense: bitcoin and the blockchain. Bitcoin is indeed very cool, although like any protocol of its nature it's a very difficult beast to predict. If AWS is Intel, and bitcoin is TCP/IP, then who is Microsoft (who abstracted away the hardware built on top of Intel) and who is Cisco (who abstracted away the ability to plug into the internet?) For the latter, possibly a company like 21 should Bitcoin win out. But in other applications (for ex. driverless cars who need to trust each other in conditions of uncertainty), it's less clear.

M2P: This is where the really interesting stuff is happening — the edge of the envelope between humans and machines. Again, a critical product to watch here is the Amazon Echo, which is threatening to abstract away many of the things we do with our phones (with which we generally interact in a clumsy, prehistoric manner) and act as a trojan horse to bring in very different kinds of products and services.

So how about applying column j here? In what ways are people being overserved and underserved for various jobs that they have?

The way to answer this question could be to ask, what needs do people have that are currently being served at a current job level, and not at a higher order job level, *because trust is scarce?* Many of the big, remaining industries that have not been dramatically reorganized by the tech industry yet — education, health care, financial services — are organized the way they are because of fundamental constraints around trust. Without going into too much detail (we'll save specific cases for future posts), there are a great many opportunities here where customers and end users of these industries find themselves greatly overserved by aspects of these industries while underserved for higher order needs. Should trust across these disciplines become abstracted away into something scalable and abundant, as Uber (for example) is accomplishing, it'll be very exciting times.

Meanwhile, there's another consequence of all of this: as the internet goes inside everything, and everyone and everything begins to trust one another, we're converging towards a phenomenon where everything begins to move onto internet time.

What is internet time? It's the difference between an internet company and a normal company: A normal company ships a new product 1–2x per year; an internet company ships code every day! It's a totally different time scale. On the internet, things change constantly. When computing and the internet go inside everything, including our own credentialing, and trust, everyone and everything moves onto internet time. In a world where trust is scarce, stasis is high, and things change slowly. In a world where trust is abundant, things can move very quickly.

The consequence? It may be that after a layer defined by information (scarce > abstracted > abundant), and then a layer defined by social connectivity (scarce > abstracted > abundant), we may be entering a layer defined by trust (scarce > abstracted > abundant) and then followed by a layer where things begin to move very quickly. What will this Internet Time era look like? It's hard to say, because we don't know how our current era of trust is going to resolve. But once trust across M2M, M2P and P2P becomes abundant, the (possibly extreme!) consequence could be that it finally frees up the state of the world to begin changing fast. Ironically, a dramatic *increase* in the amount of trust in the world will lead to a decrease in the *stasis* of the world — which is a very good thing, but also very scary.

Why is this? The main reason the world doesn't change when it should is because of the friction of established power structures. (This isn't meant to be an extremist rant against "the man"; that's just simply the case.) Many of those power structures are built around constraints that disappear when trust in its various incarnations undergoes an abstraction to abundance. As a result, we're going to see change sweep through the world at a far higher rate than we're currently experiencing. The next scarce resource at level i+2 might be, oddly enough, stability (or something like it).

Who wins in a world where change is abundant and stability is scarce? Whoever is *antifragile* — the companies and services that aren't just resident to change, but thrive in it. (Read Nassim Nicholas Taleb's book Antifragile: Things that Gain from Disorder for more on this concept.) Who are those companies? Whoever provides the primitives: those general-purpose service building blocks that can be used for anyone, for any purpose, and who don't need to predict the future so long as they can thrive in change. AWS, Fulfilled By Amazon, Facebook, Y Combinator, Medium, Bitcoin. And of course many more — some we know, some we don't, and some that aren't here yet.

At the end of the day, for the people who are building those companies (and for us as we try to identify them) it comes down to: who is building new, authentic value for customers? Who is building an abstraction for a scarce and valuable resource that will transform it into an abundantly available one? Does an n of 1 company result from this abstraction and subsequent abundance? What power structures rearrange as a result?

Every so often, we spot a company that is growing very quickly and whose growth velocity seems to not make sense given the initial conception of their market. It's that fleeting moment when you have to ask the question — could this be something fundamental? Is this more than just business as usual, and we should buy more of this stock? If these questions start popping up at a nagging rate, we can run the opportunity through this framework and see how many parts match up (or don't) and why.

The questions to ask are:

1. Ask for each box in column i:

What scarce resource is being abstracted away into something scalable, thereby modifying or eliminating the constraints around which business models were previously organized?

What is the emergent scarce element that this company can own and monopolize? (The key question to ask here is, is there a future scenario where this company de facto 'owns' x, and if others want to participate in the benefits of x in some way they have to go through here)

2. Ask for each box in column j:

In what ways have this company's customers been overserved? Remember, being overserved doesn't mean being served too well, but rather too much. Are customers' current offerings overstuffed with never-used features, or feel 'saturated' in some other way? Is the customer paying (with their money, time, or other) more than is strictly necessary?

In what ways have this company's customers been underserved? Is there some higher level reason or job the customer has that is going unfulfilled? Most critically, is there a compelling reason for the customer to adopt the new solution other than price?

3. Ask about the interaction between i and j:

Consider the higher-level job at j+1 that up until now has gone unfulfilled. Is the reason why there haven't been successful solutions at that level related to the constraint that has recently been eliminated due to abundance at level i? Does the optimal solution to the customer's need at j+1 have a clear path towards monopoly control of some element or resource at i+1? Are the conditions right for our company to become the only game in town, where they make the rules, and the world has to play?

Not every major new tech company will fit this framework — but if a company *does* fit suspiciously well, then we should consider this when evaluating an opportunity. The goal of this framework is not to make the decision, but rather to give us the structure to discuss it more efficiently with one another.

Good use of this framework will actually look like a bit like Mad Libs:

In current industry _____, customers are overserved by _____: they spend too much of their time, money, or other on _____, and it feels inefficient, saturated or wasteful. The real reason they're served by _____ in the first place is because they have a higher level need, _____. Unfortunately, it's difficult to serve these customers at this level directly because of some constraint, _____, which is often difficult to recognize.

However, that constraint melts away when _____ becomes abstracted away into something scalable and abundant because of _____. When this happens, _____ can now serve customers directly at their higher level need, _____, by leveraging the abundant element _____ in brand new ways that never existed before. When this happens, a new scarce resource, _____, emerges. Over time, the company that makes all the money is the one who gains a monopoly hold on _____ and become the only game in town.

For those of you who'd like to play with this Mad Libs style template, we'd love to see your ideas posted in the comments.

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Since this chapter is largely speculative, there may not be any one central 'takeaway' — but a few useful points to walk away with would be:

- **Trying to force the future to fit any particular model doesn't do anyone any good. However, it may still be a useful exercise to imagine how the cutting edge of what we're building now might be categorized or thought of differently when placed on top of the i+1/j+1 framework.**

- **If something seems to fit suspiciously well, it might be worth asking follow up questions as to whether there's an opportunity that isn't properly appreciated.**

- **The future is a big, weird, fun playground! The only thing we know is that it'll be different than we think. It's good to bet on antifragility.**

- **We look forward to seeing your use of the Mad Libs template!**

This marks the end of this four-part series; thanks for reading. Stay tuned for the next instalment of posts, which will look at the flip side of the coin: What happens when value falls apart? This series will launch some time in June. If you want to keep up to date, I invite you to subscribe to Snippets, our mailing list at Social Capital — as an added bonus, you'll see what we're reading on a weekly basis and get my takes on the week's goings-on. Happy reading!

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