

# **A critical perspective to exponential organizations and its hyper scalability**

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## **Abstract**

The acceleration of innovation is becoming radical and multiple types of radical innovations can be recognized. The radical innovation driven by fundamental new technological approaches is commonly known as disruptive innovation. This paper focuses on radical innovation by exponential organizations creating hyper scalability. Cases of hyper scalability (e.g. Uber and AirBnB) show clearly a general business model behind this type of innovation. In this critical perspective, we first analyze and contextualize the hyper scalable innovations. Then we consider the benefits and dangers of hyper scalable innovations.

## **Introduction**

The concept of exponential organizations addresses a new kind of organization structure that leverages openness, transparency and abundance (Ismail 2014). This name is a reference to the exponential growth of technology, like examined in the singularity research (Kurzweil 2005; Vinge 1993; Eden et al. 2013). The singularity research has gained particular attraction, as the focus on the acceleration of innovation allows an easy validation. Indeed, decades after the first suggestion, the trajectory still appears accurate. The question arises how far does the focus on the acceleration allow us to understand the changes in organization? The concept of exponential organizations is a huge success in public literature, but the little traction in academic literature should give some perspective. It is not easy to connect the literature on singularity to the literature on organizational strategy. There is need of an alternative context about ongoing technological evolution to gain perspective.

Taking a more organizational approach to understand where all technology innovations

are heading can be found in studies on the Global Brain. The Global Brain is a metaphor, describing the system of collective intelligence spread across the planetary network (Bernstein et al. 2012; Goertzel 2002; Heylighen 2008; Mayer-Kress & Barczys 1995). The emergence of the Global Brain can be seen as a transition to a higher level of complexity of evolution (Heylighen 2014; Heylighen 2000; Maynard Smith & Szathmáry 1997), inspired by what Turchin (1977) called metasystem transition. While the Global Brain allows us to reason about new organizational structures, the drawback is that the validation of the Global Brain is a wicked problem (Buchanan 1992; Rittel & Webber 1973) i.e. difficult or impossible to solve.

What do hyper scalable innovations have in common? Companies like Spotify, Square, PayPal, Facebook, and Pinterest? They serve millions of users with a very small team of employees. They commercialize a proprietary product, enabling it to scale rapidly to global proportions without linear dependence on human capital. Think about Snapchat and Instagram whom serves 100 million and 300 million monthly users respectively with a staff of less than 200. Consider Skype with 1,600 employees to handle 40 percent of all international telephone traffic. National telecommunications providers with tens of thousands employees on their payroll can claim only a fraction of Skype's call volume. Adding insult to injury, the existing players also have to bear the heavy cost of the infrastructure - giving Skype a free ride. In other words, Skype is using someone else's assets as a free lever; in this case company owned assets.

Airbnb, an online marketplace that connects people looking to rent out their homes with people who are looking for accommodation, is worth more than the Accor, Hyatt, and Intercontinental hotel chains and already has market capitalization twice that of the almost 100-year-old Hilton Group. Airbnb's 800 employees can offer over a million rooms to the market without a single cent of investment in real estate. The Hilton Hotel Group on the other hand needs over 300,000 employees to operate 680,000 rooms and requires the owners to make massive real estate investments. In other words, Airbnb is using someone else's assets as a free lever.

Similar extreme disproportionate relationships between the size of the team (super small) and market impact (gigantic) can be found in the business models of Uber, Twitter, Netflix, Kickstarter, EventBrite, Dropbox, Evernote, BlaBlaCar, and booking.com. With multiple successful hyper-scalable innovations, we can start creating a new perspective. In a first section we examine the similarities and the differences with other type of innovations. The second section gives a system-perspective on the organizational strategy of hyper scalability. The third section considers the drawback and the dangers of such organizations. In the conclusion we give policy suggestion and reflect on the wicked problem of validating the proposition.

## Analyzing radical innovations

Currently, several types of radical innovation thrive and each time different abilities are in play. In this paper, we discuss a clear focus on technology as enabler of the radical innovation, but not all radical innovations are driven by technology. For example, the use of charter cities to bring other nations into the global economy (Fuller & Romer 2012),

i.e. building entire cities for development aid, is clearly radical, but has no technological focus. A related technology innovation approach is to first innovate the technology in underdeveloped countries (Prahalad & Hammond 2002). While a relation with hyper-scalable innovations could be imagined, no cases are known that take such an approach. The strategy of developing technology in underdeveloped countries has a strong relation with disruptive innovation.

Disruptive innovation has a purely technological focus, in fact the first publication is focused on disruptive technology (Christensen & Bower 1996) echoing the work of Schumpeter on creative destruction (Schumpeter, J., 1942. Creative destruction. Capitalism, socialism and democracy, pp.82-5.). The generalization to disruptive innovation comes later (Christensen 2003). In the case of disruptive technology, a problem arises that a new technology is not as good as the existing technology, according to the benchmarks of the incumbents. The new value behind the disruptive innovation is often incomprehensible by the incumbent. The disruptive technology can thus grow in a niche until it is strong enough to disrupt the incumbent. In the niches the hard technology problems improve incrementally, a process that often takes years. When the technology is finally good enough for the mature market, the innovator now has a hard-to-trade competitive advantage i.e. he disrupts the market and takes over from the incumbent.

For hyper scalable organizations the relevance of technology is important, but not in the same way as it is for disruptive innovation. The technological focus is on software, while disruptive innovation had a clearer focus on hardware. The difference is important, as software does not need years of development in a niche, so software is not the hard-to-trade skill. For many software startups, the userbase is the hard-to-trade skill. The crowdsourcing solution of the hyper scalable innovation to build the userbase has a bootstrapping problem. Once enough people are using the system, it works, but the hard work is to gain a first critical mass. Disruptive technology startups gain a hard-to-trade skill by going into a niche. Hyper-scalable startups do not focus on a niche per-se. Locality seems more relevant to have a starting point: you can make the innovation relevant to a small group if you stick to a small community. For example AirBnB has gone door to door in Manhattan and Brooklyn to sell their service and so bootstrap the community (Gebbia 2015).

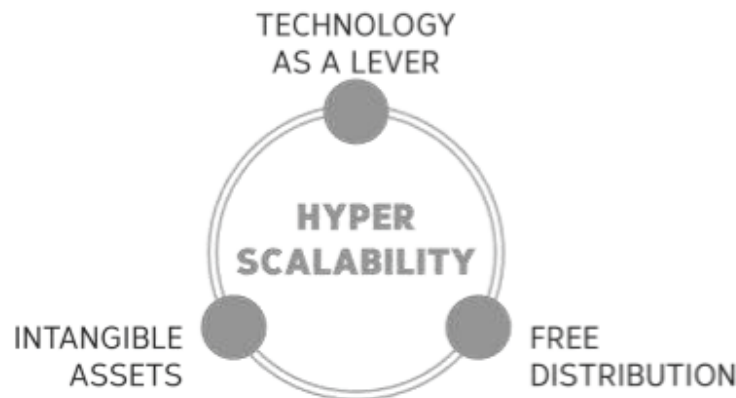
Next, a difference also exists towards key assets. For disruptive innovations, technology is the key aspect and the incumbents recognize this technology, but do not value it. Hyper scalable innovations have a focus on intangible assets, which is a radical difference with the incumbent organization. The shift to intangibles is in a way an architectural innovation, which is the reason why incumbents can't react to the startups. Architectural innovations (Henderson and Clark, 1990) focus on big development (e.g. ships, airplanes) and argue it is easy to innovate modular (e.g. the engine), but hard to innovate across the whole system. This way, the startup has different hard-to-trade skills compared to other startups (i.e. the userbase), versus hard-to-trade skills compared to incumbents (i.e. organizational architecture).

The business development in product companies can explain another part of the hard-to-trade skills for the hyper-scalable innovation. A trend in product companies is to stop

selling products and give a broader service package. One such example, is Bosch Packaging (Brashear et al. 2012), that is leasing instead of selling the equipment. While the logic is sound, the value proposition creates a paradox (Gebauer et al. 2005). For example the cost reduction to apply this service innovation to cars is large, but part of the value proposition is the ownership of the car. For the B2B market, leasing cars is a practice, but introducing the innovation for B2C segment is difficult. Hyper-scalable innovations also have the service paradox and only few startups have created the proper value proposition that fits.

## Hyper-scalable business model

The hyper scalable innovations have a strong relation to the main feature of the Global Brain: synergy between people and technology. Indeed, the rules of the fast emerging digital world require a combination of the strengths of machines (precision and scale) with the strengths of people (insights and creativity) and using them as levers for growth and innovation. There are, in our view, three critical building blocks to create a Hyper Scalable business model (see figure 1). At first, the three building blocks may appear trivial. Details can demonstrate the less evident aspects of the three building blocks.



Before we can examine hyper-scalable we need to understand the origin of the scalability. With digitalization of existing media (e.g. books, photos, music) an introduction can be given. First media was not scalable: a master-apprentice relation transformed knowledge; a musician had to perform. The use of recoding mechanism would print the media into a carrier, allowing some degree of scaling. Carriers like books and painting are as old as our cultures and tracking back the origin leads deep into history. For example, some investigation for the "camera obscura" date back to classic period, but the development got much more intense in the early 19<sup>th</sup> century. The recoding of sound would soon follow with the phonograph (circa 1877). It may be strange to consider books and paintings technology, but with camera and phonograph the technology is clearer recognized. The focus on the deep history is essential to understand how disruptive technologies gain a competitive advantage. Because of the exponential curve, incumbents are skeptic about the development until it accelerates, but then it is too late. For hyper-scalable the technology leverage is an aspect of the hyper-scalable innovation, not the focus. The userbase as the competitive advantage relates to the second building block, the

free distribution.

When media records got digitalized in virtual carriers the media became hyper-scalable and indeed the Internet becomes the free distribution. The Internet is itself no free (some one needs to pay for the servers, cables, electricity, software, maintenance, etc.). The trivial understanding of free distribution is that the infrastructure cost is so broadly carried in our society that it appears free. In particular the cost turns neglectable because Internet, leverages local market into the global playfield (Freidman 2005). The less trivial meaning of free can be examined by considering some side effects the digitalization.

For example an interesting social agreement existed when records (books, music, movies) had a physical carrier (paper, CD, DVD). As long as you buy the physical carrier, you could share it with friends and family. With the digital carrier this social-contact got disrupted. On the one hand people start sharing over the Internet, on the other hand the industry created limitation so you couldn't share the digital version even with your family. In many ways recent research is still investigating this phenomena and some suggest it can revolutionize the Internet once more. Research on "offer networks" investigates the role of Global Brain for a sharing economy (Heylighen, 2016). This research suggests the development of a new Internet protocol, demonstrating a new layer of free distribution:

TCP/IP was the protocol that interconnected all local computer networks. URL was the protocol that identifies any document residing on any Internet-connected computer. The HTML protocol formats such documents, so that any computer could read them.

Many other protocols exist that have a more niche application. The most local protocols are a program interface to an application (API) so that other programs can interact with them. The emerging of API has pushed the need for protocols a bit to the background, but to increase efficiency, i.e. to make it a free distribution, the protocols are still essential. The effect of free distribution leads to new business perspectives. Anderson (2004) elaborates that the virtual zero cost of digital product creates revenue even for the marginally sold products. Physical assets always require a certain quantity to get sold to carry the costs of storage, transportation, etc. It becomes even more interesting when moving from digital products to intangible assets. Hyper-scalable organizations are rarely about digital product, in fact they are often about tangible products in a service setting, but different to the early mentioned service innovation.

All of hyper-scalable innovations seem to leverage underused assets. In a way they activate what De Soto (2003) calls dead-capital. De Soto describes dead-capital in the context of underdeveloped regions (e.g. slums) and the natural development of extra-legal systems, which has no relation to technology. Hyper-scalable innovation seems to identify new forms of dead-capital by going digital. The digital-dead-capital gives us an understanding of ownership inefficiency. By owning something, you reduce the usage of that thing. For example a car stands most of its existence parked, similar many other tools a person owns are used inefficient. So far it is similar to the service innovation approach. The big difference is the dead-capital. Service innovation is about transforming product

companies into service companies. Hyper-scalable organizations are about leveraging someone else's assets i.e. understanding the dead-capital and making it possible to create a market for it. Examples are AirBnB, transforming the inefficient use of guest rooms into capital, and Uber, transforming the empty seats in your car into capital.

We need to question why the capital was underused: on the one hand it is a trust issue (allowing a stranger to use your property), on the other hand it would be too much work finding clients for too little value. Both the trust issue and the efficiency are the focus of the hyper-scalable organization. It is the reason why bootstrapping the userbase is the competitive advantage. The hyper-scalable organizations are creating what we earlier examined as mobilization systems (Heylighen et al. 2013): technologies that enable trust, motivate and coordinate human actions. The mobilization systems are a larger category, hyper-scalable focus on those mobilization systems that can leverage the dead-capital. For example the mobilization systems allowing political mobilization have so far not been recognized in hyper-scalable innovations.

## Disruption of the Social fabric

The efficiency of hyper-scalable organizations is impressive, but as with anything, it has a drawback. In a market where the constraints of space and time are obsolete, the old forms of protection from competitors that companies enjoyed - most notably geographic - is being removed. As a result, almost every market that is digitalized effectively becomes a winner-takes-all market. The Bell distribution curve will be replaced with a Power law whereby the second company enjoys a market share that is half of the one before. Think Google. The competition is not a little bit smaller; it's less than half the size of Google. In a world where 1% of the population has 50% of the wealth (Hardoon 2015) this drawback should be taken very seriously.

Where in the past unions could negotiate fair prices, the problem now does not lie with the employees. Often the employees are well paid and well educated. No great increase in revenue is reached by squeezing out a small team. Such educated talent also has many alternatives, making them again less of a target. The irony is that the possible target for getting squeezed has no clue; they are the providers of the offer, i.e. those who own the tangible asset. We expect that once the hyper-scalable organizations get under pressure to increase their revenue, when they don't see a solution in innovation, but in a more conservative approach, they will negotiate the share of revenue they share with the providers on the platform.

Of course it was dead-capital, so even a small payment is good and of course today many hyper-scalable innovators are rising stars, so cost reduction is not yet an issue. We also recognize that hyper-scalable organizations most likely explore new innovations, so the concern may not be an issue any day soon. Still when it comes down to increasing revenue by cost reduction, cutting the provider revenue it is the only large enough group to get squeezed. So it seems good to create political awareness around the issue, particularly if we consider the disruptive effect it has on our social fabric. The disruptive effect of the social fabric is already a problem and the reason many cities ban hyper-scalable organizations to operate in their region. The possible dangers are however much

larger as currently being recognized.

We need to recognize that by creating labor-intensive tangible assets, the business creates secondary value: creating work and derivative assets. For example to rent rooms you need to build hotels, invest in decoration, etc. In a way the hyper-scalable innovation is stimulating a monoculture, which reduce the resilience of our economy. Similar to how monoculture creates problems for agriculture. Let us use the metaphor of chopping a forest to elaborate the problem. As long as the chopping is less than the regenerative ability of the forest, we have no problem. Metaphorically the hyper-scalable organizations look like a hyper efficient chopping company capable of wiping out the rainforest. In other words, the big problem is we may be killing our future. We believe a denial of this danger will continue to exist until the investment stop create an inevitable paradox. As with many fundamental new values, the denial may transform to despair without ever considering a constructive solution.

An investment stop leads to a paradoxical logic described as "the spiral of dead" (Christensen & Raynor 2003): The incumbent needs to cut costs when sales go down. By killing the project with no-direct value, they save the revenue on short term, but build a certain dead for the future. Of course the short-term evaluations of CEO only stimulate this perverse system. The process is clearly recognized and may be one of inevitable reason behind the short lifetime of fortune companies (Hamel & Prahalad 1992). While the spiral of dead already creates enough collateral damage, the hyper-scale innovation could result in hyper-dead-spirals. By the time the problem would arise (i.e. diminishing returns), we are looking at a dominant company representing most of the market. Not a company gets killed but a whole market. Such a picture is frightening, making uncommon big crises (e.g. banking crisis, real-estate crisis) become common.

## Conclusion

We began this paper with the concept of exponential organization and the question whether the focus on the type of growth could explain the radical innovation perceived. In fact, we can question whether the exponential growth is essential (e.g. why not factorial or logarithmic?). Instead, we suggest the focus should be on the hyper-scalable organization structure. Hyper-scalable innovation is driven by technology, so we have compared it mostly with another radical innovation driven by technology: disruptive innovation. The comparison shows that the hard-to-trade skills are fundamentally different. For disruptive innovation the hard-to-trade skills relate to the improvement of the technology. For hyper-scalable innovation the hard-to-trade skills relate to gaining a critical amount of users.

We have developed a hyper-scalable business model and identified three building blocks: technology as leverage, free distribution and intangible assets. Information technology as leverage makes assets scalable. Working with intangible assets makes it hyper-scalable. To elaborate that the Internet as a free distribution system is not trivial, we had to elaborate the dead-capital. By going digital, the dead-capital inside underused resources creates a debate about ownership. A debate not uncommon on the Internet for many other reasons too. The debate is even recognized in other innovation literature, particular the

shift from product selling companies to service companies (using the product).

In the more critical part we examine the dangers of hyper-scalable innovation. We focused on the growth and the effect it has on dominating a market. The speed redefines what resources are scarce/abundant, defining what is free and what requires payment. A metaphor can help clarifying the change. Human productivity has become so powerful that it results in global warming and dumping CO2 into the environment now stops being free. We recognized for hyper scalable organizations that "getting leaner" also stops being free. With tangible assets, the focus on getting leaner was good. With intangible assets all can get so lean it becomes dangerously specialized creating a huge resilience problem. Take into account that such hyper-scalable organizations dominate a market shows how dangerously fragile our future markets can become.

To end this paper with on positive spirit, let us create a suggestion on how to address the dangers. A comparative study between the incumbent and the hyper-scalable innovator can bring clarity, like investigating the lost of diversity (i.e. the secondary values). Of course we do not need to wait for any study to take countermeasure actions. In particular the hyper-scalable innovator are best place to address the problem, after all it's about their future. A suggestion is to ensure part of the revenue being tangled in investments of the assets. For example, Uber could partner with garages and include checkups as extra-legal benefits for the providers. The lost in diversity is also an issue the innovator could take on, by providing more of an "offer network" i.e. stimulate the secondary value. For example AirBnB could get into the business of helping people create guest rooms. Now that its capital is activated, more people may consider it a good investment and it would create more business for AirBnB so it seem logical solutions for a dangerous problem.

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