

Post-Pandemic Innovation Strategy

Strong Governments are the saviour,
not another Silicon Valley



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We tend to associate technological innovation with the private sector. Whilst that might be true for incremental innovations, it's certainly not true when it comes to systemic radical innovations.

“ Every step of the way, to everyone around us, we should be asking the question, what are you building? What are you building directly, or helping other people to build, or teaching other people to build, or taking care of people who are building? If the work you're doing isn't either leading to something being built or taking care of people directly, we've failed you, and we need to get you into a position, an occupation, a career where you can contribute to building. ” - Marc Andreessen (VC at Andreessen Horowitz).

We have a problem with the way we think about innovation. And the recent pandemic was the last straw that broke the camel's back. At the height of the pandemic, Marc Andreessen, one of Silicon Valley's stalwart VC's (who's got a heavy portfolio including early seeds in Instagram, Facebook, Oculus VR, Netscape etc) authored a piece that sent shockwaves across the industry on "IT'S TIME TO BUILD". In it he lays out this pent-up frustration on the institutional failures and our lack of ability to 'build'. As I write this piece, almost 1 million people worldwide have already died of the recent pandemic according to the official figures. Despite all of the other social, economic and technological progress we've made over the last decades and the intellectual arrogance we inherit as a civilisation as a result of that, no western institution (whether public or private) can opine that they haven't failed.

Going forward, I think it's an opportunity for us to start from a clean slate and do things better when it comes to innovation, i.e. graduating from this investing in software-driven blings that will become IPO-size in 3-8 years and start investing in things that actually matter: healthcare, infrastructure, biotechnology and long-term systemic technology shifts.

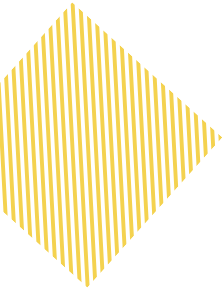
THE MYTH: GOVERNMENT HAS LITTLE TO NO ROLE IN INNOVATION THAT MATTERS

The biggest blocker we have when it comes to doing this though is the popular myth we've bought ourselves into. We've convinced ourselves that 'great innovation' only means: the private sector Silicon-Valley-esque model of 'letting the free animal spirits of the market' take care of innovation and somehow automatically markets will align to produce things we actually need. Although the laissez faire free-market ideology does produce incremental innovation and efficient markets, it's terribly incapable of producing radical innovations as some economists have conceded for a while now.

Silicon-Valley: Forgotten innovation history lesson

We just have to take a simple history lesson to know that radical technological innovations come about more as a result of dedicated government will than the randomised caricature of the marketplace. We easily forget that the 'roots' of Silicon-Valley lie with government-backed focused innovation in the first place. The historian Margaret O'Mara elucidates in detail in her book *The Code: Silicon Valley and the Remaking of America* that the Soviet Sputnik space race caused the US federal government to invest mammothly into silicon chip companies. In fact in the 1960s, the US federal government spent more money in R&D (research & development) than the rest of the world combined. This shifting of the technological base by an order of a magnitude due to government R&D spend and availability of high tech silicon chip firms is what most of the early investors in the Valley bankrolled and henceforth giving us the trend we have today.

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So what the history of Silicon Valley is intertwined with focused government R&D one might interject. Well let's have a look at the history of some of the other radical innovations that we know of today:

- The Internet: Forty years ago the pioneering research to invent what we know now as the internet was funded by U.S. Department of Defense's Advanced Research Projects Agency (ARPA) project called ARPANET.

- Google's foundational page-rank algorithm work came out of the Clinton-era Stanford Digital Libraries Project (SDLP). The SDLP itself was funded by a coalition of government federal agencies including the National Science Foundation.

- Semiconductors: The 1980s saw the US government work closely with the private sector with SEMATECH to give rise to a lot of the semiconductor innovations we have today

- Microchips: Yes even the core hardware of your iPhones and Pixels. During WWII, the Department of Defence provided funding to firms like Fairchild Semiconductor and Texas Instruments to build a tiny device that could help make missile targeting more precise, the result was the silicon microchip.

- GPS-technology: Again the product of the US Defense Department work in the 1970s to follow the exact locations of nuclear missiles and calculate their proper trajectories

- Barcode technology: Another NSF funded research, checking out of the supermarket and supply-chains would be hellish without this.

- Touchscreen technology: iPhone or iPad might not have been possible without funding from the NSF and the CIA to researchers at the University of Delaware in 1996. Apple purchased the technology in 2005 and tweaked it to develop the iPhone screen.

- Vaccines: as this famous NCBI paper elucidates, public-private partnership has been the single-most important lever in vaccine development in the last 50 years.

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If you look at the origin of most mega-corporations, you will see a link with government. IBM hit it big when it won the original contract for providing the counting machines that processed FDR's new Social Security program. General Motors, Boeing, Honeywell, and Anheuser-Busch all leapt past competitors thanks to World War II contracts. Chase and Bank of America have grown massive due to too-big-to-fail policies. Citigroup has been bailed out multiple times over its 175 year history, and grows bigger each time. Fidelity and State St. grew huge both from managing government pensions and from exploiting 401k regulations. TV broadcast companies and telecoms gained a market oligopoly due to the methods of auctioning off spectrum rights. And last but not the least, we all know the billions of dollars of government subsidies that Elon Musks's Tesla benefitted from.

Problem with the current Venture Capital model and need-based radical innovations

Now that we've established the centrality of great government vision in driving radical innovation forward. Let's take a look some well-known critique of the private sector VC investment model. It's important to caveat this section with the fact that, no one here is trying to rubbish the private sector models, they clearly have a great role in driving market/price efficiency and allocation of resources. However, just like all other man-made ideologies, it's not perfect and would warrant critique as well.

Here are some salient pitfalls of the private-sector investment model that we should be cognizant about:

Flavour of investments: Venture capitalists look for companies that can reach IPO size, which means they need an idea that can find a big market. These factors combine to produce a very specific set of requirements oriented towards 'fast profits' and 'familiar patterns'. The problem with letting private investment alone drive innovation is that the money is skewed toward the most lucrative markets. The biggest practical uses of AI have been to optimize things like web search, ad targeting, speech and face recognition, and retail sales. Pharmaceutical research has largely targeted the search for new blockbuster drugs. Vaccines and diagnostic testing, so desperately needed now, are less lucrative. More government money might have boosted those pursuits. Carol Dahl, executive director of the Lemelson Foundation notes that in the United States 75% of venture capital goes to software. Some 5 to 10% goes to biotech. The pennies that are left basically goes to transportation, sanitation, health care. This skewed funding dynamic is particularly flawed at producing a 'complete system of innovation'.

Time horizons: Private investors don't usually take into account long term investments. The usual maximum investment market time horizon for a private player is 3-8 years. This is problematic as fundamental radical innovations have a longer germination period and require nurturing for longer periods (e.g- a fundamental tech like internet took approx 20 years). As an individual private market player, the VC investor is simply not incentivized to look at reaping benefits over a long term time horizon

Value capturing: For long-term systemic radical technological innovations that have 20-30 year maturity periods and most importantly have multi-industry applications, it's very elusive for an individual to invest and capture value from that. The pockets of value created on multi-industry fronts are erratic and not guaranteed either, henceforth it's not feasible for an individual investing entity to have an appetite and patience to capture value to get enough returns.

(Note I'm not an economist by trade, but if you want to get into the robust economic analysis of what I mentioned above, please read this [paper](#) on Industrial policy-making by two leading economists in the field)

“Governments should lead the way in funding high-risk moonshot innovations private sector investment models can’t afford”

It’s worth noting here that having short-term horizons and making investments is perfectly fine. It is the bedrock of our market economics that has made the post-Soviet economic models so successful and it’s entirely acceptable for executives/managers to expect short-term returns on their work. However, societies, civilisations and polities unlike one private firm, goes on forever: henceforth it’s only valid to think about the long-term

Hence, governments should lead the way in funding high-risk moonshot innovations private sector investment models can’t afford, and it’s out of such research that radical new technologies often arise. Any country’s capacity to invent and then deploy the technologies it needs is shaped by public funding and government policies. With vaccines, treatments, tests for covid and with the compounded latter challenge of climate change, it will be a great litmus test of our civilisation’s innovation system.

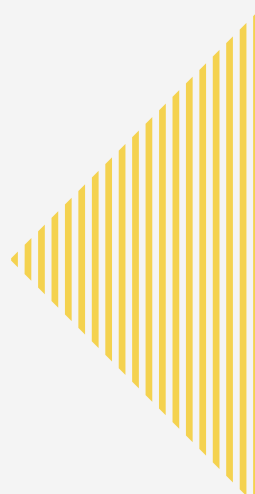
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