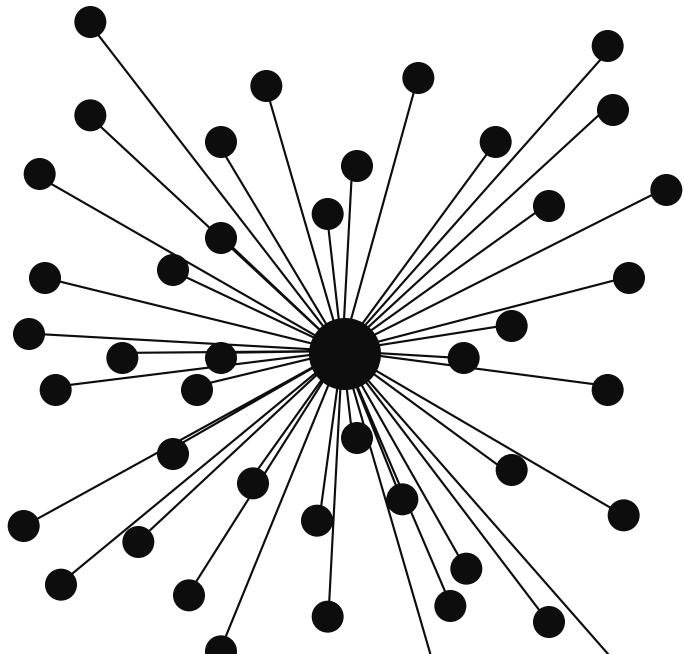


Decentralization in all the things

An essay by Mike Masnick of Techdirt

We're at an inflection point in the way we view society.

We've been locked into industrial age views in an increasingly digital age. The economic and industrial policies of today are still tied to a world that existed over a century ago, and there are so many ways in which we can and should rethink them. This goes way beyond just planning for an ever increasingly digital world: it means taking the lessons of what a digital world has taught us -- including upending some antiquated thinking about scarcity -- and applying it much more broadly to society.



We are at a unique moment when we can re-envision an open society that works for everyone.

So much of our thinking about today's world is based on a mental model that effectively *craves centralization*. **We're working off of a model that focuses on efficiency and profit maximization** that automatically pushes towards centralization and what is, in effect, a dictatorial (benevolent or not) view of how society should be structured.

As such, it should not be particularly surprising that **we see vast consolidation and diminishing competition in the corporate world**, or growing illiberalism and authoritarian control in the political world. Our own societal structures have demanded it, and those same structures make it feel as if there are few ways to alter the overall path, but that's mainly because we're viewing the issue through a very narrow prism.

Centralization has some benefits. It can lead to greater coordination and efficiency. It creates a much clearer chain of command and control. However, it also has downsides. **Greater consolidation can certainly limit (or potentially stifle) competition and innovation.** And the direction a project, company, or government takes becomes dependent on an individual or a very small group of powerful people.

Sometimes they may lead things in a good direction, but there is a very real risk that they make bad, destructive decisions. Alternatively, they might make decisions that are more focused on retaining power and control than on benefiting the public.

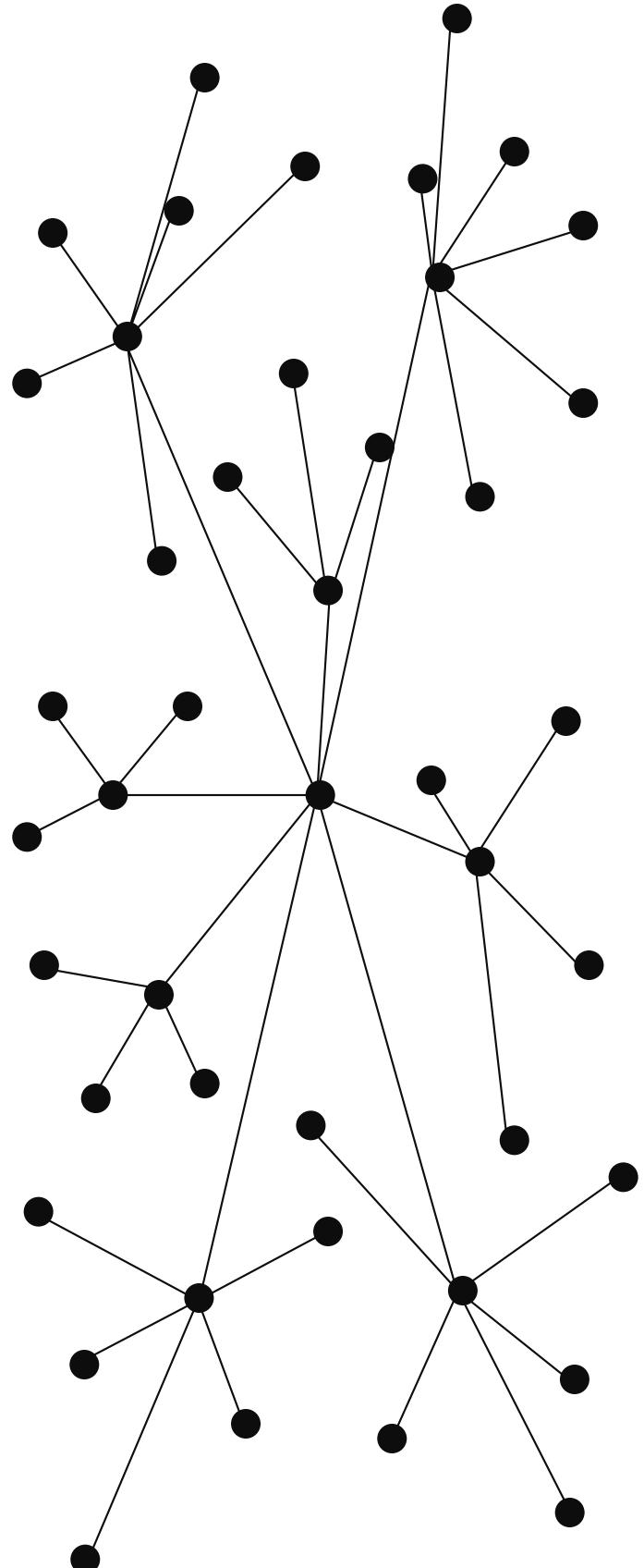
Decentralization also comes with a mix of positives and negatives. Smaller, more decentralized projects can be more nimble, quicker to adapt and change. The fact that lots of smaller groups are trying out ideas allows for rapid experimentation with different approaches, often leading to faster iteration and innovation, driven by competition rather than sheer power and dominance. It also **distributes power to the end, decreasing the risk of abuse of power.**

But decentralization has its own challenges. It often removes the economies of scale and limits the ability to make the huge investments that are necessary for major leaps forward. The lack of a single central structure can often lead to significant waste and errors. Sometimes it can lead to directionless or counterproductive meandering, or wasteful and duplicative efforts that could be more successful when combined.

Often, we see the pendulum swing between more centralized and decentralized worlds. As things become too centralized, problems like limited competition and abuse of power make themselves clear, so we break things up and hope that a more decentralized world will result.

And maybe it does, for a period of time. But then the focus returns to economies of scale and efficiencies, and things **recentralize**.

Rather than focusing on making the world more decentralized or more centralized as a whole, this article proposes a better approach: understanding how to determine **which things should be centralized and which should be decentralized**, and how the two can actually complement each other, such that the benefits of each are available while the negatives are minimized.



From interstate highways to the information superhighway

A key contribution to the economic revolution that helped the American economic engine in the second half of the 20th century was the interstate highway system. While it took nearly half a century of political fighting to get it done, the economic benefit to America has been massive. The system cost approximately half a trillion dollars to build, but studies have shown that **for every dollar spent on the interstate highway system, it has returned \$6.** By just about any measurement, as an investment in infrastructure, it has created massive positive returns for society.

The interstate highway system opened up huge new opportunities for business in a wide variety of ways, by creating core infrastructure that allowed so many other businesses to exist and build on top of it. The highway system vastly cut down the time it took to travel across the US, opening up the ability to ship goods quickly and efficiently around the country. It enabled entirely new businesses, like UPS and FedEx, to thrive. It also opened up new opportunities for state and local governments to build off of the interstate system and create local roads and opportunities for different kinds of **useful economic growth.**

In some ways you could view the interstate highway system as the culmination of a massive centralized bit of planning. It required the power and will of the US government to build a singular interstate system. But what's most fascinating about how it worked was that it actually allowed for a much more decentralized power to make the interstate highway system useful.

This lesson is important: having centralized infrastructure that is open and on which others can build in a decentralized manner can open up tremendous possibilities.

And we see that same pattern in the internet.

In some ways the internet is an even better example than the interstate highway system, because the internet did not require a huge centralized planning system to build the infrastructure, nor is the upkeep of the internet reliant on the same centralized system. Instead, it was built and created in a distributed manner, as an open system that **anyone could build on, adapt, and contribute to.**

As a **centralized open protocol**, it enabled amazing decentralized benefits. The protocol allowed anyone to build on it and experiment. And out of that grew tremendous benefits, through open innovation. A consistent, standardized protocol allowed for widespread innovation through competition, a standardized infrastructure basis on which to build, and a singular ability to communicate across the different experiments.

Out of this comes the best benefits of both centralization (efficiency, economies of scale, enabling infrastructure) and decentralization: distributed power, adaptive and rapid innovation, and the ability to be more nimble and responsive to opportunities.

This applies in other areas of the internet as well, including its **network layer infrastructure**. At certain times and in certain regions, there have been experiments with wholesale open access and local loop unbundling projects, in which the core physical infrastructure (generally a fiber-optic buildout) is available for anyone to offer customer-facing Internet Service Provider (ISP) services to.

In that scenario, you **avoid the inefficiencies of needing to build multiple versions of the core infrastructure** with its high capital expenditure requirements, but still enable competition. Different ISPs can innovate and compete by offering different types of services with different features, but they can do so by leveraging the same core infrastructure.

Here you see the basics of this model at work: the high capital expenditure effort becomes the core infrastructure, but that **infrastructure is open for experimentation where low marginal cost services can be built atop it**.

In some places, such as Ammon, Idaho, this has created a world in which changing your broadband provider means going to a portal, reviewing a page with competing ISP service packages, and clicking on the one you want. No installation is needed. No new hardware is needed.

Again, this further enables the benefits of both approaches. **You don't need inefficient and wasteful overbuilds of the infrastructure**, but you get greater competition, innovation, and nimbleness for the consumers.

The UK has implemented a similar framework, with some limitations, in which BT effectively became the central wholesale provider for a variety of competitors. More recently, BT spun off the division handling this, Openreach, as a separate company. This has created a world in which users in the UK have access to many more competitive broadband options than elsewhere in Europe, and the speeds have been, generally, faster than other countries in Europe. There were some concerns about the shift to fiber-based broadband, but in recent years, Openreach and others have been rapidly building out fiber networks to meet the demand among users.

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Time to swing the pendulum back

The keys to making this work are fairly straightforward: core infrastructure, preferably built on an open model or owned by no one as an open protocol, creates a standardized foundation. From there, you push the power to the ends, **allowing lots of people to build on that foundation, enabling competition and innovation**.

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These days many will point to the internet and highlight that it has moved away from this ideal. While the open internet protocol exists, some of the services on top — services that many people use and rely on — have become large and centralized. In some ways, the pendulum has swung away from the original decentralized aspects of the early internet. **It's become slow, large, anti-competitive and prone to abuse.**

But there remain opportunities to swing the pendulum back in the other direction.

There are concerns about vast centralization (one search engine dominating the market, one social network on which much of the planet relies, etc.) but it doesn't need to remain that way. **There are real opportunities** to build for a future in which we go back to using open protocols as core infrastructure, while enabling the power to shift out towards the ends of the network, with encouragement for competition and innovation to make things more useful.

This doesn't mean there won't be large players who are more successful than others, but if they're based on an open protocol it avoids the current lock-in problems, and creates powerful incentives for better behavior.

Email is a useful example for this. Email is based on a series of open protocols, starting with the **Simple Mail Transfer Protocol (SMTP)** which was widely adopted. These days, the most popular email provider is Google, with its Gmail service. Some might argue that this shows that the more decentralized model described above has failed, but the details suggest otherwise — especially when compared to a fully proprietary stack, such as social media.

Yes, Gmail has a large market share, but using Gmail does not cut you off from others using other email providers like Microsoft's Outlook, Yahoo Mail, or a privacy-focused provider like Proton Mail. While it's not technically easy, users can host their own email as well. They can all communicate with one another, and if you are using one service, and feel it's not serving your needs — or worse, has become untrustworthy — **you can export your emails, move them to a different service, and still communicate with everyone else.**

In contrast, if you find Facebook untrustworthy and decide to leave, you will lose out on the conversations happening there with your friends and family. That's a **centralized silo** in which Facebook's corporate entity, Meta, has full control, and can even remove you entirely.

If you look through the development of Gmail, you can see the advantages. Even as it is owned by Google, and questions have been raised elsewhere about Google's business models and practices, with Gmail it has stayed quite benign. In the early days it did run ads, some of which were based on keyword scanning of your emails. Many people found that an intrusion on what they felt should be more private messages, so eventually Google moved away from that model, likely realizing that if people felt their **privacy was at risk in Gmail**, they could just easily move to a competing service and not lose access to anyone.

Facebook, on the other hand, has the power to be much more aggressive in pushing its own decisions on users, even ones that are more questionable regarding user privacy. Yes, users may abandon the platform over the long run (some of which appears to finally be happening), but it's a much slower process, and while it's happening, users who abandon Facebook have to live without the content and communications on Facebook that their friends and family rely on.

Towards a better decentralized future.

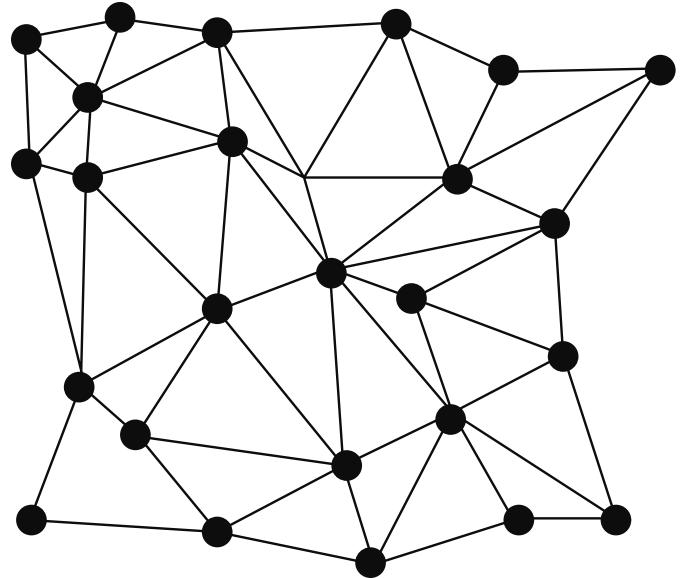
It is, then, not difficult to envision a better world built on this model. **Create the core infrastructure as a base.**

Make it a kind of open protocol. Enable others to build on that base to leverage the power of the standardized and connected infrastructure. Allow that experimentation and competition to drive new, different, and useful innovations.

We could, for example, see social networks built on this model. There are many such experiments happening today, with the most successful current one being **ActivityPub, the underlying protocol of the “Fediverse” that has enabled Mastodon**, a social network with no central “owner,” but rather a series of individual social networks that federate, enabling cross communication. This model has created some interesting opportunities and experiments, as different federated “instances” experiment with different approaches, different features, and different rules. But many of them can communicate with each other. Some choose not to federate with others, and some servers block other servers.

It has created a whole new ecosystem of experimentation and learning that **does not involve a centralized power that can be abused.**

And that’s just one experiment. There are many more being worked on as we speak, often creating models that are even more decentralized and may prove even more interesting in the long run.



Distributed Structure

Taking it back out of the internet

Early on in this piece we used the example of the interstate highway system, and how it acts as a kind of “protocol” that enables so much above and beyond it. You have local towns and cities that built their own roads and systems around the interstate highways. You have entrepreneurs and businesses that built up around the highways as well, and those who leveraged the highways to make other things possible, like the ability to ship goods across long distances quickly and efficiently.

As we look at the power of this model, it’s worth considering what else it can apply to. Already we are seeing some rethinking of financial systems (with some potential pitfalls, but also many opportunities) when there is a more **decentralized monetary system** built on an open protocol.

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Many of the most interesting decentralized finance applications are coming out of the global majority regions, rather than the U.S. and Europe. Projects like Umoja.money are focused on building out a payments infrastructure that can work in “the hardest to reach communities on earth.”

But it can apply elsewhere as well. Healthcare and education, these days, are often held up as industries that have too long been stymied by the old ways of doing things, resistant to change, and where prices have been driven to unfortunate levels, sometimes blocking access to those who cannot afford it (on the healthcare side, the direct-to-consumer cost issues are limited to the few countries, like the US, that do not have universal healthcare, but even in the rest of the world that does have universal healthcare, there are often complaints about the system being less innovative and responsive to customers than it could be).

Indeed, in recent months, healthcare systems in both the UK and Canada have faced difficult challenges, commonly dubbed “healthcare crises,” as the systems are strained and under-resourced, often due to still-increasing costs on the systems themselves coupled with a shortage of healthcare workers. So, merely having universal healthcare systems does not solve the underlying challenges of modern healthcare.

This model presents new ways to think about these issues. Reframing the problem could lead to a world in which healthcare is revolutionized such that treatments (which have high capital expenditure upfront, but low marginal costs for each one) could become a form of an “open protocol.

As advancements in rapid manufacturing technologies become common, you could envision a world in which the chemical composition of life-saving drugs could be downloaded and “printed” out of a home device.

The information, the “recipe” for the medicine, could be part of the open protocol, but other services could be built up around it that enable better, more equitable access to medicines, bundled with other services. There are many forms this could take. For example, what today might be considered a “life insurance” company might find a benefit to itself in keeping its customer base healthy for much longer. Suddenly, it might **not be a “life insurance provider, but a holistic health provider**, where it has every incentive to help you stay healthy and well by suggesting healthier foods and exercise plans and providing access to life-saving medicine as part of its holistic offering.

This type of model can work in countries with universal healthcare as well, where the issue now is reframing the setup of the systems in a manner that maximizes health benefits while minimizing the costs that are straining those systems. Coming up with ways to make the medicines and treatments more widely available—creating open protocols, recipes, and instructions—could lead to an entirely different framework, in which the resources that today are used to fund many of these things can be focused more on core research and development, rather than on the cost of individual products and offerings.

Education can be rethought of in the same manner. Today, most education is, for good reason, local and distributed, which is quite useful for enabling teachers to better understand their students. But it also means that the best teachers can only reach a tiny number of students at a time. A merged model, in which decentralized teachers can make use of the best lesson plans, lectures, teaching aids and tools, and **bring them to children around the globe**, can be envisioned under this same model.

Build up the core infrastructure, the basic building blocks of education from the best teachers anywhere, and allow distributed teachers to make use of that material. You can even create a more personalized learning environment this way, perhaps by **flipping the traditional model of in-class lectures and at-home “homework.”** Students could watch virtual lectures at home, and then class time could be better used for more individual instruction as the teacher works with students to make sure they understood what they learned.

These are just a few examples of how we can begin to rethink so many parts of the way the world works today, empowering some of the best features of more centralized systems with the power of decentralization. Keep the centralization to a process of an open, standardized core infrastructure, and allow that to be the hub on which innovation and experimentation can occur.



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Mike Masnick is the founder of Techdirt, a blog that covers the intersection of technology, business, and policy. Masnick is known for his critical analysis of the tech industry and its impact on society, and has been recognized for his contributions to the field of journalism.

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