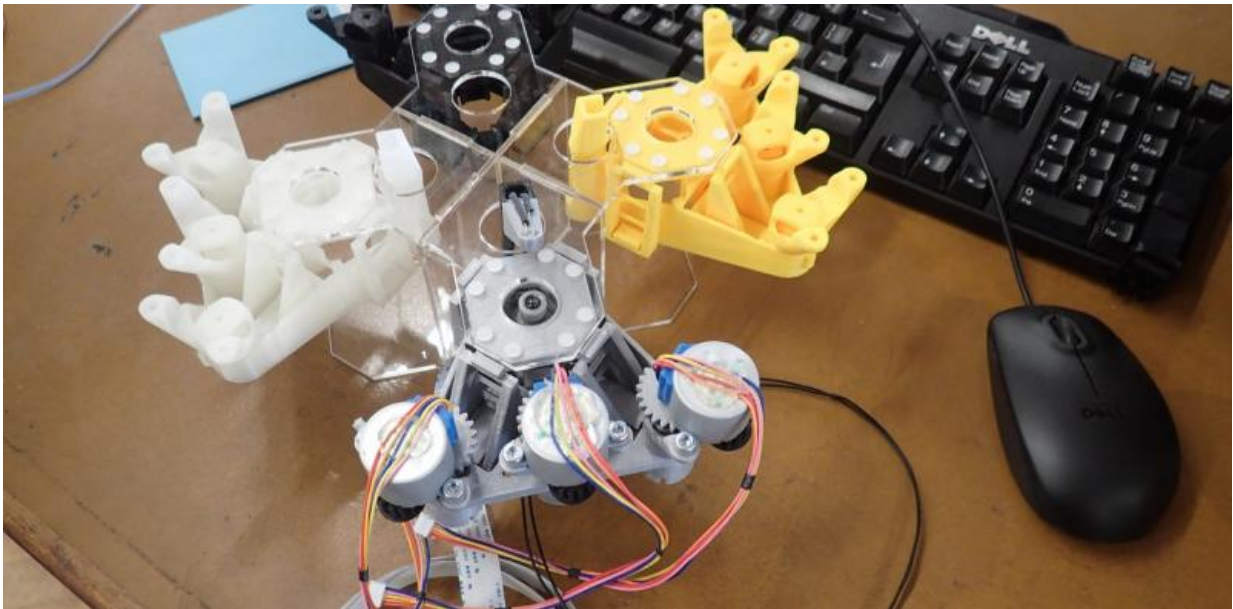# Early days of internet offer lessons for boosting 3D printing

June 29 2016, by Adam Thierer, George Mason University

Innovating with 3D printing offers huge promise, such as these 3D-printed microscopes. Credit: SynBioSRI/Flickr

Even in its relative infancy, 3D printing has created an enormous list of possibilities: dental aligners to straighten your teeth, unique toys for your children, inexpensive custom prosthetics for people with limb deficiencies, and restoring lost or destroyed cultural artifacts. It can also be used to create untraceable firearms and an endless supply of copyright infringements.

Just as when the internet developed, 3D printing is opening doors to amazing opportunities and benefits – as well as some undeniable dangers. Also called "additive manufacturing," 3D printing's enabling of truly decentralized, democratized innovation will challenge traditional legal, economic and social norms. Potentially faulty products and counterfeit goods are again among the leading concerns. Some people are already calling for preemptive regulation of 3D printing on those grounds.

But we must be patient and cautious, rather than rash and worried, when creating laws and rules governing this new method of innovation. As scholars who have studied technology policy issues, my collaborator Adam Marcus and I propose allowing wide experimentation without regulations or restraint, a concept we call "permissionless innovation." As problems develop, they can be dealt with as reality, not hypotheticals.

We have a roadmap for this approach to technology innovation because it's the same one the Clinton administration adopted two decades ago for the internet. Its 1997 Framework for Global Electronic Commerce said the U.S. government intended that "the private sector should lead [and] the Internet should develop as a market-driven arena not a regulated industry." The goal was to "encourage industry self-regulation" and "minimal government involvement or intervention" so as to "avoid undue restrictions on electronic commerce," the administration argued.

Huge benefits

In the case of the internet, the results of this openness speak for themselves. Once policymakers gave digital innovators an unambiguous green light to experiment with new technologies and business models, U.S.-based information technology firms quickly became household names across the world. As Vint Cerf, one of the fathers of the internet, wrote:

"The Net prospered precisely because governments – for the most part – allowed the Internet to grow organically, with civil society, academia, private sector and voluntary standards bodies collaborating on development, operation and governance."

Booz & Company's [annual survey](link) of the world's most innovative companies reveals that eight of the top 10 are based in the United States. Most of them are involved in computing, software, or other internet-based technologies. But the more important success story involves the countless small digital innovators that are always popping up to provide exciting new gadgets and services.

Additive manufacturing can benefit from that same sort of vision – if today's lawmakers are willing to once again embrace permissionless innovation.

Properly assigning legal responsibility

One concrete way policymakers can achieve that goal is to take another page from the early days of the internet. In the Telecommunications Act of 1996, lawmakers created [legal protections for websites that hosted content](link) created by others. This was like telling the owner of a public bulletin board that she couldn't be sued if someone posted something bad on it. This move [helped encourage](link) more vibrant online speech and commerce.

A [similar liability shield](link) may be needed for 3D printing intermediaries, to ensure that the threat of excessive litigation doesn't chill innovation. Device makers and website operators that host [blueprints for 3D-printed objects](link) shouldn't be held responsible for what others do with those designs.

Neither should the manufacturers of 3D printers be held liable if an

average citizen uses them to create weapons or medical devices that cause harm to others. People who use 3D printers to cause harm should be responsible for any damage, not the creators of the general-purpose technologies.

A variant of that liability protection may also be needed against intellectual property-related claims. Luckily, we can again build upon existing internet law, which frees sites like YouTube and Flickr, which depend on user-contributed content, from copyright infringement liability, as long as they obey the [Digital Millennium Copyright Act](#) of 1998.

Under the DMCA, so long as online intermediaries promptly block or remove allegedly infringing material from their systems when they receive notification about it, they cannot be sued for having a role in any copyright violation. It wouldn't be surprising to see that "notice-and-takedown" process extended to 3D printing services and platforms.

At present the landscape is unclear, with neither regulation nor a promise to be cautious about introducing it.

Preparing the ground for real innovation

Of course, problems will arise, but when they do, we should not leap to introduce regulation for 3D printing. First, we should apply existing laws – those governing contracts and property rights, and fighting fraud, for example. Also, the Federal Trade Commission and state attorneys general have broad consumer protection powers to police "unfair or deceptive acts or practices" that may occur.

Educational efforts will also be essential. For better or worse, any efforts to regulate 3D-printed creations will be extremely difficult to enforce; solutions beyond regulation will be needed. Industry, non-profits and

government bodies can work together to craft sensible guidelines for appropriate uses of these technologies. Lessons for students could explain the dangers associated with building certain 3D-printed applications that might have potentially dangerous societal impacts, including weapons or counterfeit products. Industry could also develop voluntary best practices and developer guidelines.

In the end, there is more reason for optimism than pessimism when it comes to additive manufacturing. Like the internet before it, 3D printing is another important generative technology. It can unleash the creativity of the next generation of innovators and spawn entirely new, life-enriching products and services in the process. We should focus at least as much on protecting the possibilities of innovation as we do on safeguarding ourselves from potential harm.

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