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2014

Disruptive Technologies and the Law

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102 Geo. L.J. 1685 (2013-2014)

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INTRODUCTION

Disruptive Technologies and the Law

NEAL KATYAL*

It's great to be here with all of you. This symposium actually has its origins in a sort of technology: I was on a flight to Silicon Valley, and despite living thousands of miles away from him, bumped into Professor Desai. We got to talking about disruptive technology, and ultimately began spinning out thoughts on 3D printing. Soon thereafter *The Georgetown Law Journal* asked for ideas for their symposium, and thus this fantastic event was born.

Disruption: In the past two decades, the concept has gone from theory, to buzz word, to the captivation of the popular imagination. Disruptive innovation goes beyond improving existing products; it seeks to tap unforeseen markets, create products to solve problems consumers don't know that they have, and ultimately to change the face of industry. We are all the beneficiaries of disruption. Every smartphone carrying, MP3-listening, Netflix-watching consumer is taking advantage of technologies once unimaginable, but that now feel indispensable. Silicon Valley's pursuit of disruption will continue to benefit and delight a world of consumers. But where disruption may once have been the secondary result of innovation, disruption has become a goal in and of itself. Today, I want to urge a cautionary note: The tech community's solipsistic focus on disruption, to the exclusion of human and legal values, can be problematic. We can see these potential problems in the development of three areas: mass surveillance, 3D printing, and driverless cars.

In 1890, in their classic article establishing a right to privacy, Louis Brandeis and Samuel Warren wrote, technologies "have invaded the sacred precincts of private and domestic life; and numerous mechanical devices threaten to make good the prediction that 'what is whispered in the closet shall be proclaimed from the house-tops.'"¹ This passage appears quaint today in its details; it refers to the new Kodak "[i]nstantaneous photographs" and the "unauthorized circulation of portraits of private persons."² But the sentiment, and the argument in favor of a legal right to privacy, applies equally today.

After all, cameras were once bulky, noisy devices, and unwilling subjects at least knew that they were being photographed. Today, virtually everyone has a noiseless, unobtrusive camera in the form of a smartphone. And the prolifera-

* Paul and Patricia Saunders Professor of Law, Georgetown University. © 2014, Neal Katyal. This piece is a transcription of Professor Katyal's oral remarks that introduced the Symposium on November 8, 2013. He wishes to thank McKaye Neumeister, Yale Law School class of 2017, for terrific research assistance.

1. Samuel D. Warren & Louis D. Brandeis, *The Right to Privacy*, 4 HARV. L. REV. 193, 195 (1890).

2. *Id.*

tion of wearable cameras is making it easier than ever to constantly, discreetly photograph and record those around you and instantly upload the images and video to the internet. Consider Eye-Tap, an over-eye camera developed by Dr. Steve Mann, who has been developing and using wearable cameras and computers since the late 1970s. Consider smart watches with recording capabilities. And consider innovations like Google Glass that incorporate “heads-up displays,” so that users do not have to look away from their lines of sight.

Wearable computers and their cameras present great benefits. They’re hands free, less bulky and distracting than traditional cameras, and they allow users to seamlessly record their life as it happens. I can take a picture of my kids, for example, without a hitch. Some police departments are also using wearable cameras, having officers attach them to a hat, collar, or sunglasses.³ However, wearable cameras and computers present several concerns. For starters: a) they can look ridiculous; b) they may infringe on privacy; and c) they can violate social norms. People are often annoyed and downright angered by the possibility of being filmed in public without their consent—leading sometimes to episodes of violence against users. These concerns are exacerbated by the potential for facial recognition software. Google has said it will not make these features available on Glass “without having strong privacy protections in place.”⁴ However, hackers will find ways around this prohibition. The potential for constant public identification and surveillance is unnerving generally. And in certain situations it completely flaunts social norms. Some bars, casinos, and strip clubs have already instituted bans on the technology.

Wearable cameras are just one aspect of disruptive technology that threatens individual privacy. As Professor Slobogin has discussed in his paper for this symposium, there is a risk of “panvasive surveillance” through fusion centers, domestic drones, cameras, and the collection of communications metadata. These techniques can undoubtedly have positive effects. Cameras can locate missing persons, alert authorities to suspicious packages, and solve crimes. In fact, such cameras were used to help identify and find the Boston Marathon bombers and the London Underground bombers.

But the ease and broad scope of this surveillance raises serious social and legal questions about the right to privacy. Recall, for instance, *United States v. Jones*, in which the Supreme Court held that the Government’s attachment of a GPS device to the suspect’s vehicle constituted a search under the Fourth Amendment.⁵ Many in law enforcement had thought that these forms of tracking were not problematic: if the Government could pay a police officer to monitor a vehicle 24 hours a day, why should the result be different if technology does the work instead? But the Government missed the key lesson of

3. Randall Stross, *Wearing a Badge, and a Video Camera*, N.Y. TIMES, Apr. 6, 2013, <http://www.nytimes.com/2013/04/07/business/wearable-video-cameras-for-police-officers.html?pagewanted=all>.

4. Google Glass, *Glass and Facial Recognition*, GOOGLE+ (May 31, 2013), <https://plus.google.com/+GoogleGlass/posts/fAe5vo4ZEcE>.

5. 132 S. Ct. 945, 949 (2012).

cyberspace—something Larry Lessig realized many years ago in his first cyberspace book, *Code*—that a difference in degree can become a difference in kind with enough technology.⁶ Today, I worry that Silicon Valley gets too enamored by tech and has not fully internalized Lessig's lesson. A difference in degree can sometimes morph into a difference in kind, making extrapolation from our past to the new advanced technological age a fraught endeavor.

A second up-and-coming technology to consider is 3D printing. Since its birth in the 1980s, 3D printing has morphed from an area of research to the mainstream. We have 3D printed drones, prosthetic limbs, and blood vessels. 3D printing is becoming accessible, with printer models available for under \$500.

As Professors Desai and Magliocca note in their paper for this symposium, 3D printing could help startups by increasing the ease of experimentation. New companies could design, print, and test new creations quickly and cost-effectively in-house. New ideas will carry less financial risk. As GE has found, 3D printing can also help bigger companies produce components. This could ultimately bring manufacturing back to America from overseas. 3D printing may even decrease pollution, as it reduces the need for shipping. And individuals will have access to goods that they couldn't find in the store or wouldn't otherwise be able to afford.

Beyond the realm of manufacturing, the possibilities are endless. 3D printing could revolutionize medicine. The technology is already being used to produce prosthetic hands. Doctors are experimenting with custom 3D printed casts to support broken bones. Others are working to print the bones themselves. And 3D firms are working on printing 3D organs with a patient's own cells. Someday, 3D printing could provide an organ to each of the thousands of people on the national organ donor waiting list.

The disruptive effects of 3D printing are sure to be felt in a number of industries, in ways we cannot yet imagine. But some problems are easy to predict. The one that has captured the public's imagination is the potential to print dangerous things, such as unregulated and undetectable plastic guns. This past May an engineer uploaded a video to the internet in which he tested a 3D printed gun, made with only \$25 of plastic. However, as Professors Desai and Magliocca note, the gun issue may very well be a red herring, and there may be several ways to regulate the 3D printing of firearms. Apart from weapons, 3D printing carries the potential for individuals to get hold of other unsafe products. Drugs—both prescription and illicit—could be printed at home, without the safety net of FDA inspection or approval. And home-printed objects in general, such as children's toys, would not have the benefit of testing and inspection.

Beyond the nefarious, 3D printing could create major economic dislocation. Millions of people in factories could lose their jobs. And apart from that, the technology poses new and interesting legal questions. For example, how should

6. LAWRENCE LESSIG, *CODE: AND OTHER LAWS OF CYBERSPACE* 21 (1999).

we think about the patentability of 3D printed organs made from human cells? 3D printing also presents a generalized challenge to intellectual property. 3D printing removes the traditional barriers to production, making patent, copyright, and trademark infringement easy. It has the potential to cripple the intellectual property system and chill innovation. Inventors may be wary of pouring time and finances into something that people will copy and print for themselves instead of purchasing.

The law must adapt to this future. Professors Desai and Magliocca begin the process of thinking through the potential threats to intellectual property and how the law can evolve to accommodate this exciting area of innovation. How should the law treat the threat that 3D printing poses to workers' livelihoods? Issues of safety and regulation? The potential moral and ethical questions raised by bio-printing? These debates will play a role in the evolution of the law.

Finally, a third technology discussed in this symposium is driverless cars. Self-driving cars will be available to the public within this decade, and the legal roads are being paved now in anticipation. Nevada, Florida, California, and D.C. have passed laws permitting the testing and use of autonomous cars, and further legislation is pending in many other states.

Of the numerous potential benefits of self-driving cars, the foremost is safety. There are 5.5 million total car crashes in the U.S. per year.⁷ Driver error is the primary factor in 93% of crashes.⁸ Over 30,000 crashes per year are fatal.⁹ Of fatal crashes, over 40% involve alcohol, distraction, drugs, and/or fatigue.¹⁰ The economic cost of crashes in the U.S. is \$300 billion per year, or 2% of GDP.¹¹ Traffic crashes are the primary cause of death of Americans ages fifteen to twenty-four.¹² With the implementation of driverless cars, researchers predict fatality rates could ultimately fall to 1% of current rates.¹³ Even if autonomous vehicles constituted only 10% of total cars on the road, it would save 1,100 lives per year.¹⁴ With 90% penetration, the U.S. would save 21,700 lives and have 4.2 million fewer crashes. Per year.¹⁵

Consider also the reduction in congestion and fuel consumption. Twenty-five percent of congestion is caused by traffic incidents—which autonomous vehicles would largely avoid.¹⁶ They would communicate with one another and the overall transportation system, monitoring traffic patterns and choosing the

7. DANIEL J. FAGNANT & KARA M. KOCKELMAN, ENO CTR. FOR TRANSP., PREPARING A NATION FOR AUTONOMOUS VEHICLES: OPPORTUNITIES, BARRIERS AND POLICY RECOMMENDATIONS 4 tbl.1 (2013), available at <https://www.enotrans.org/wp-content/uploads/wpsc/downloadables/AV-paper.pdf>.

8. *Id.*

9. *Id.* at 3.

10. *Id.*

11. *Id.* at 4 tbl.1.

12. *Id.* at 3.

13. *Id.* at 4.

14. *Id.* at 8 tbl.2.

15. *Id.*

16. *Id.* at 5.

best route. And they would travel closer together (more like a train than a conventional car) and at higher potential speeds, increasing highway capacity and minimizing traffic congestion. At 90% penetration, American drivers would save a total of 2772 million hours of travel time, and 724 million gallons of fuel per year.¹⁷ Including the potential reduction of crashes, traffic, and fuel consumption, it is estimated that self-driving cars could save the U.S. economy \$450 billion annually.¹⁸

Statistics aside, self-driving cars will provide important social benefits. They could provide transportation for the disabled and elderly who are currently unable to drive themselves, giving them increased mobility and independence. They could transport children without a human driver, easing the burden on overworked parents. People would no longer need to focus on the road while behind the wheel. Instead, they could be productive, able to do work or focus on their families. Self-driving cars would also make parking significantly easier. Large parking lots and parking scarcity would be things of the past (in much the same way as the phenomenon of being “lost” is today).

But there are also downsides to this new technology. Autonomous vehicles could potentially threaten jobs: in the freight and transportation industries, buses and tractor trailers could begin to drive themselves, and traffic cops would no longer be necessary. Self-driving vehicles would also open the country up to a number of new security concerns. Hackers could tamper with autonomous driving software; terrorists could infiltrate the central transportation system.

Liability in a world of driverless cars is one of the great legal questions to come. Accidents will happen, and the questions of responsibility and cost will be complicated. We currently have no legal framework for such liability. Professor Smith’s discussion of changing liability in light of certain disruptive technologies is the starting point for considering the changing relationship between seller and consumer, and tort liability in a future of driverless cars.

All of the technologies discussed in this symposium are truly disruptive, in the best sense. They will become inseparable parts of modern life because they serve important social needs. Wearable cameras and computers allow us to share our lives and participate in the digital community. 3D printing quenches our thirst for innovation and self-sufficient production. And driverless cars will save us time, fuel, and lives while increasing mobility and allowing us to focus on what really matters. But we cannot forget the potential harms, such as the invasion of privacy, violation of intellectual property rights, and liability concerns surrounding this technology. The law must fill this gap. That is, after all, what the law is about: Providing human values in an age where technology causes both profound wonderment and profound disruption.

17. *Id.* at 8 tbl.2.

18. *Id.* at 17.