Sandbox Thinking

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There is no one sign welcoming us to the digital age. Instead, there are markers all around. Just look: The ones and zeroes that are the vocabulary of contemporary computing have become the common language of information worldwide. We depend on this steady stream of digital data each day, in every aspect of our civic and commercial lives.

To access all of this information, we are dependent—as never before—on communications. We know this intuitively. Few of us leave home today without a mobile device in our palm, pocket, or purse. We expect that text, pictures, video—all manner of media—be available to us at just about any time and place. Much of our economy depends on increased broadband capacity and the decreased cost of cloud computing to send us information wherever we go. But as profound as our present reliance on digital data and communications is, it is only going to grow. Because around the bend lies the Internet of Things, where billions of machines with sensors communicate with one another, turning today's stream of data into a torrential flow.

While this new digital landscape is exciting, it can pose real challenges for oversight. That is because our regulatory frameworks often have their origin in laws that predate the Internet.

In a presidential debate six years ago, then-candidate Barack Obama alluded to such a problem in the financial industry. He suggested that "we still have an archaic, twentieth-century regulatory system for twenty-first century financial markets." But his pronouncement has a broader application. I know because I am a regulator. At the Federal Communications Commission (FCC), I have the privilege of having a front-row seat for the digital revolution. Every day ,I get to see how Internet-based connectivity is remaking our world. Every day, I get to wrestle with how to apply old laws to a digital communications landscape that is changing faster than ever before.

Let's be frank: This is not easy. The traditional regulatory process can be cumbersome. It can be risk-averse and hostile to new ideas. It is rarely as nimble as the digital economy itself. But we need to fix this, and I think we can —if we embrace the idea of government in the sandbox.

Software developers often code "sandboxes" into their programs. A sandbox allows others access to a portion of the program without harming the host platform. It provides an opportunity to experiment within the program,

minimizing risk before introducing ideas on a broader scale. Entrepreneurs, for instance, use sandboxes to test new ideas, assess consumer response, and study budding markets.

The technology industry has been extending the idea of the sandbox to all sorts of developments. It means that innovators no longer have to perfect new concepts in obscurity only to bet the farm on launches of large, yet unproven, ideas. Instead, they can set up small experiments to tinker with their projects and expose them to real-world conditions. Think of it like the scientific method: develop an idea, test it, and examine the new result. If what develops is promising, find a way to build it on a larger scale.

Sandbox thinking is popular among startups in Silicon Valley. But why not put it to work in Washington? After all, testing big ideas on a small scale is a good way to understand the consequences of important policy choices before unleashing them in the world at large.

To understand the potential power of government in the sandbox, consider the typical path of a regulatory proposal in Washington. A good idea develops deep within a large federal agency. It sees the light of day through the rule-making process, which gets started with publication of the proposal in the *Federal Register*. Stakeholders see the proposal and submit their comments. Experts in the agency toil over these comments. They refine their thinking through outside input, a series of summits and panels, and the occasional blue-ribbon commission. Then, without the benefit of testing in the real world, the government unveils a finished product, crosses its fingers, holds its breath, and hopes everything turns out for the best.

Needless to say, this is not ideal. There is too little opportunity for iterative learning—testing ideas and making quick adjustments based on experience. Plus, the penalty for failure is real—from protracted litigation over authority to a corrosive public cynicism about the ability of government to innovate and implement new ideas. Moreover, with new technologies changing fast, a slow, ponderous rule-making process is not a visionary way to plan for the future.

So what if instead of relying on the big reveal, we set up small-scale policy experiments? What if we examined the effects of new rules before unleashing them all at once? Could efforts in Washington improve if we made more space for policy sandboxes? I think the answer is yes. More than that, I think where I work—the FCC—is a terrific place for sandbox thinking. Even better—and a point of pride—is that we are putting it to work right now.

Take broadcasting. Broadcasting has a special place in our media markets. In a world of exploding online content, local television is still a dominant source of local news and information.

Broadcasting, however, is not immune from changes in technology and spectrum efficiency. In fact, it is now possible to offer a station signal using less than the full six megahertz of spectrum the FCC historically provided to full-power television broadcasters via license. This means two broadcasters can now occupy a single swath of six megahertz without losing the ability to send their signals over the air. In turn, this makes it possible to pack more services into fewer airwaves. Congress took note of this opportunity and passed legislation in 2012 that encourages television stations to combine their technical operations and broadcast over less spectrum. To sweeten the pot, Congress directed the FCC to offer broadcasters financial incentives to make this switch.

This is a novel idea in communications policy. So instead of studying how to make it work through the time-consuming traditional rule-making process, the FCC did something different. Rather than putting in place a program designed for national scale, the FCC started small. We created a sandbox. We identified two broadcasters in Los Angeles—KLCS and KJLA—and ran a test. The FCC provided these stations with special temporary regulatory tools. Then the stations got to work and actually figured out how to implement channel-sharing. By sharing spectrum, the stations were able to use less of this scarce resource to broadcast without sacrificing picture quality for viewers. As a result, we now have lots of information about technical and legal issues that arise when broadcasters share facilities under real-world conditions. This is invaluable. It will inform future FCC policy-making about broadcast operations. It provides new insights into spectrum efficiency. And just as important, it will help the television industry plan for the future.

Our work in the sandbox goes beyond broadcasting. It speaks to telephony, too.

There was a time—not too long ago—when every household had a home phone connected to a copper line. No more. Today, two out of five households have cut the cord and use only a wireless phone. On top of that, the growing popularity of new forms of voice service, like voice over Internet protocol, means that fewer and fewer households are relying on traditional voice service over a copper connection. We know there is a big gap between the technologies consumers are using to make calls and the decades-old technology that informs our regulatory framework. We know we need to update our policies on a national scale. But big initiatives involving consumers like this can get bogged down in risk-averse Washington.

To avoid getting stuck, the FCC headed to the sandbox. We solicited proposals from incumbent telephone providers seeking to update their networks to better reflect the choices being made by consumers. We asked providers to identify communities to test the process of moving services away from copper wire facilities to newer networks based on Internet protocol. We set goals and parameters for these experiments and offered to issue waivers and make policy adjustments to facilitate this process. As a result, we now have two community sandbox proposals—in Kings Point, Florida, and Carbon Hill, Alabama. In time, we hope to have more.

When these experiments get underway, the FCC will be in a prime position to study the technical challenges of network change, the legal and policy issues that arise, and the real consumer consequences. By studying them on a small scale we will have opportunities for iterative learning and time to tweak new rules before we unleash our new network policies on a national scale.

With the world gone wireless, the FCC is also making use of sandboxes through our experimental licensing process. Mobile services are multiplying. Sensors that send information wirelessly will soon be appended to countless common devices and many of our machines. Our homes will be connected, allowing us to turn on heating and turn off pipe valves remotely. Our cars will have sensors on key engine components, letting us know about mechanical troubles before they occur. Our health-care providers will be able to use wireless capabilities to monitor us wherever we go, which can save time and improve outcomes. Our workplaces and schools will change, too, as mobile capabilities transform the way we communicate and access content in the office and classroom. All of this wireless activity, of course, is bound to yield new innovations.

To expedite development, the FCC has provided a sandbox for wireless experimentation. We have developed an experimental licensing process to help researchers and developers gain access to airwaves and play with power levels. This means more developers can test new wireless services in research laboratories and universities across the country. Already, these experimental licenses have produced systems to support rocket launches, patient-monitoring equipment, and robotic technology for the armed forces. But we want to keep the cool coming. So we need to make a point of learning from these experiments. By adjusting our policies over time, we can keep these sandboxes active and continue to foster the development of innovative services.

There may be no single sign to announce the arrival of the digital age, but one look at our networks, our content, our commerce, and our lives tells you that it is here to stay.

The regulatory state, however, needs to catch up. The values that have informed our regulatory activity in the past are still solid. Opportunity, fairness, and security still matter. So do priorities that have informed our communications laws for decades, like public safety, universal access, competition, and consumer protection. But in the digital age we will need to find new ways to honor these principles—and also new processes.

We need our regulatory state to be more agile and more innovative. To do so, why not take a page from technology itself? We need more government in the sandbox. Because by starting small, we can embrace new digital-age ideas in a big way. ▶