THE LARGEST MAN-MADE PLATFORM IN HISTORY

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On the planet today, there are more mobile devices than people. Approximately one-third of those devices are smartphones, and that number will grow as older technology transitions out of use. We are entering an era where, for the first time in history, every human on the planet will be addressable by machine.

When we think about mobile, we're not talking about the lone device in your hand. We're talking about all of the connected devices that we interact with on a daily basis. With a supercomputer in every person's pocket, the modern mobile age is exciting and empowering. Billions of people are going online through mobile devices, and not just in the developed world, but across the globe.

This new state of hyperconnectivity will profoundly impact society, technology, health care, education, commerce, and finance. With so many aspects of human life being affected, you might think this change would happen gradually, but that is not the case. The transformation is taking place at an unprecedented pace, making mobile the biggest and fastest-growing man-made platform in history.

Behind this revolution, there are four converging trends that act as the catalyst for change. The first trend is worldwide Internet usage. When it was created as a reliable communication system for the government back in the 1960s, the Internet was not meant to be a consumer product. Yet, it has been adopted into the mainstream in a way that has completely changed and expanded communications, and its influence can be seen everywhere. For example, tradi-

tional media has grown and adapted around the Internet, with a progressive blurring of lines between the Internet and television, radio and publishing. Much of what we do is now inextricable from online technology.

Back in 1995, people believed that the Internet would be transformational and, with luck, one percent of the population would be connected. We couldn't foresee the astronomical presence the Internet has in our lives today. At the time of publication of this book, there are more than 3.3 billion users on the Internet, representing almost 46 percent of the world's population. The number of internet users has increased tenfold from 1999 to 2013. The first billion was reached in 2005, the second billion in 2010, and the third billion in 2014.

The Internet has become so ingrained in our society that it's starting to be regarded as a human right alongside drinking water and clean air. I believe this is reasonable—the Internet is now the primary way we connect, share information, and access the collective intelligence. People who lack the means to get on the Internet are at a significant disadvantage socially, educationally, and economically.

The second trend is the fact that global smartphone adoption is what is going to drive the next three billion Internet users. More than ever before, we're able to access the Internet through apps and untethered mobile devices. People who are connecting online for the first time will take a different on-ramp than that of many longtime Internet users. The classic desktop computer, keyboard, mouse, and browser

experience is already beginning to go the way of the fax machine. These three billion new users will skip the computer experience entirely and access the Internet through thirty-five-dollar Android smartphones. What's the impact when, in a few short years, 80 percent of the world's adults have a smartphone in their hands?

There are several results that we can confidently predict. The most obvious outcome is that widespread possession of mobile devices will drive greater Internet usage. We also know that there is a correlation that shows greater Internet usage the lower a person's income. Not only does this mean we'll have more people connected to the Internet, but we should also see more online engagement. We've never been less alone than in today's digital world, and interconnectivity is going to become that much more important as we move forward.

The third factor for change relates to the Internet of Things, or how all of our devices connect with one another. The smartphone era was all about the aggregation of sensors and creating multipurpose devices. When you think about the first mobile phone that gained widespread adoption, it was an analog device with a singular function: voice calls. One of the first features added to that phone was a camera. It was an awful camera that took relatively low-quality photos, but it was the first sensor integrated into a phone that wasn't related to making phone calls. And today, smartphone cameras have virtually replaced point-and-shoot cameras.

Over time, more sensors were added to the phone to serve

different purposes. When the first iPhone was introduced, it contained sensors such as an accelerometer to tell the user which way the phone was oriented and an LED light sensor that could brighten the screen when needed. Eventually, the advent of multiple imaging sensors allowed the phone to have both front- and back-facing cameras. Now we've entered an era where it is almost a competition among tech companies to see how many sensors can be put into a device. For example, the modern smartphone today contains nearly twenty sensors including gyroscope, accelerometer, magnetometer, proximity, fingerprint, temperature, light, pedometer, and of course at least two cameras. The smartphone is a marvel of technology that now vastly outranks the computer that put the first man on the Moon in the 1960s.

The Internet of Things is the opposite of the multisensor device—it's a fragmentation of the sensor bed. With the cost of sensors dropping to the point of relative insignificance, we can now have single-purpose sensors doing different jobs. A smart home could contain several of these devices, each performing a specific job but networked together and connected through the cloud. For example, a smart thermostat is basically a computer controlling the environment's temperature. A connected home could also have door locks that open when sensing a person's presence or the tools to change the color of connected light bulbs. The result is a system of single-purpose sensors that are combined into a network to perform specialized functions. The idea of low-cost sensors talking to the cloud is what defines the Internet of Things, and this is made possible by the supply chain of low-cost components designed for, and feeding, the smartphone ecosystem.

Predictions claim that, by 2020, we're going to have over six and a half connected devices per person on the planet, which adds up to approximately fifty billion more connected devices. People immediately think of smartphones when they hear the phrase "connected devices," but this category includes tablets, smart watches, home automation systems, smart televisions, connected cars, and more. Many of us in developed countries already own at least six of these devices. I believe the predictions may be wrong in that people will have *more* than the estimated six and a half connected devices per person. The numbers add up quickly, and I think most people will suddenly realize that they have more connected devices than they originally thought.

The fourth driver of change is the millennial generation. They are currently the largest generation, outnumbering the baby boomers and making up the majority of the workforce. In the next few years, they will be making 50 percent of purchasing decisions. Why is this important? The millennial generation was born and bred on mobile technology, and they are mobile natives. They use technology in a different way than people who adopted it later in life. This means that marketing and product design decisions will increasingly be made with millennials in mind, and companies will have to consider their unique needs and habits when developing new devices. The millennial generation is not unlike the three billion new Internet users that we'll see soon, in that many millennials skip traditional access to the Internet, instead coming online straight through mobile.

By 2020, we should see two to three times more smartphones

than PCs being used by consumers. The mobile smartphone is the first tech product to be bought by everyone on Earth, across multiple generations. A baby boomer may not know how to use all of the features of a smartphone, but the point is that this is the first device in history that was not made just for the technologically savvy. Computers require specific skills to operate, troubleshoot, and repair, but the smartphone is built to be intuitive and consumer-friendly. Everyone with a smartphone can figure out how to work the basics.

It's ironic that we have these infinitely more sophisticated devices in our pockets, yet we don't have to explain to everybody how they work. If you hand a two-year-old a tablet, he or she can poke at the screen and intuitively figure out how to navigate the device. The same can be said for an eighty-year-old grandmother who can take a photo and share it with her grandchildren. The process has become so easy and clearly explained that no one even realizes they're using a computer anymore.

These four trends—worldwide Internet usage, global smartphone adoption, the Internet of Things, and the millennial generation—will continue to shape the mobile revolution as it grows. Back in 2008, today's mobile reality was not a foregone conclusion, and we can easily say the same for tomorrow's. Mobile technology lives up to the title of biggest and fastest-growing man-made platform in history and shows no signs of slowing down. While we have an abundance of well-informed predictions, we can never know for sure how the future will unfold. What we can do is influence how mobile evolves.

As we move forward, it's important to understand how technology has evolved so we can remind ourselves not to hold too tightly to our definition of mobile today. Yesterday, mobile devices were used on the go. Today, they're also used in the home. Tomorrow, they will be used everywhere. We have worldwide adoption of devices that are more powerful, more user-friendly, and more ubiquitous than any other technology product in history, and they're all connected. Therein lies the massive opportunity for today's thought leaders, innovators, and creatives to shape the future of technology.