NIANTIC

TESTIMONY

of

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before the

Committee on Commerce, Science, and Transportation
United States Senate

"Exploring Augmented Reality"

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Introduction

Mr. Chairman, Ranking Member Nelson, and members of the Committee, my name is John Hanke, and I am the founder and Chief Executive Officer of Niantic, Inc., a mobile gaming company headquartered in San Francisco, California. On behalf of the 75 dedicated and innovative professionals at Niantic, it is an honor to be here before you today to talk about augmented reality, or "AR," and specifically, the current state of AR technology, where it's going, and what lessons we have learned that would be of interest to you as policymakers.

We understand today's hearing may in part be due to the extraordinary global response to Niantic's latest mobile app, Pokémon GO. We are particularly proud that this game has helped to turn the world's attention to the current reality and enormous potential of AR for entertainment, education, and community-building.

With that said, I know I speak for all of my colleagues at Niantic when I say that what we experienced following the game's launch in July far exceeded our own imaginations. As we rolled out the game, the immediate reception was almost surreal. My wife emailed to tell me that Jimmy Fallon and Stephen Colbert are talking about Pokémon GO. Professional athletes and celebrities began tweeting pictures from the app of themselves with Pokémon. Thousands signed up for a Pokémon walk on the National Mall here in Washington, and a similar walk in San Francisco. How this game insinuated itself into everyday conversation and pop culture in and outside the United States sparked even greater interest and usage.

Since July, the app has been downloaded over 600 million times, and is enjoyed by users in more than 100 countries. And it's just been a little more than four months.

With the unanticipated popularity of the game, we had a couple of outages as we scaled up, and of course, hacking was a constant and costly nuisance. With help from our former colleagues at Google, we quickly arranged for server expansions to keep up with demand. We also made critical adjustments to deal with hacking.

Since early October, things have settled into a more manageable pace. After the initial sprint, our team was exhausted, but elated. It's been rewarding for all of us to see people young and old enjoy something that we worked so hard to create. We've heard and continue to hear stories about people getting outside, spending time with their friends and family, meeting new people and discovering new places in their communities. These stories speak directly to our core mission with augmented reality – to use technology to get people off their couches and outside to appreciate the wonder of the world around us.

Augmented Reality and Niantic: The Hidden Story of How We Got Here

Niantic is focused on using existing mobile technology to augment what we see outside before our very eyes. It's important to clarify what we mean when we talk about AR. The term "augmented reality" was first coined by a researcher at Boeing in 1990 to describe a system that overlaid graphics onto a display of physical reality. The primary early adopters of this technology in the 1990s were in military and medicine. By 2002, an article in *Popular Science* called augmented reality the "killer app in portable computing," but back then, to recreate what you can now see today through your smartphone required twenty-six pounds of off-the-shelf equipment strapped to your back.

It's often said here in Washington that public policy struggles to keep pace with innovation, but when I imagine someone in 2002 walking with a heavy backpack of first generation augmented reality gear, it reminds me of a simple truth we have in Silicon Valley: Innovation struggles to keep up with our own imagination.

As I look at my own experiences with technology, I've sought to bring innovation a little closer to my own imagination. There are a number of critical developments in telecommunications and information technology, from improved processing power to wireless broadband, that helped bring augmented reality to everyday consumers, but two critical factors for me in particular were maps and games.

As I was growing up in Cross Plains, a small town in central Texas, I'd read National Geographic and pull the maps out. So it's no surprise that I would later combine my fascination with programming with my love of maps. In 2000, I was part of a team that started a company called Keyhole, which was later acquired

by Google and became the foundation for Google Earth. At Google, I also led the team that launched Google Maps, and other "Geo" products and services.

It was great to be at Google and channel my map and travel-inspired imagination from my boyhood to the innovations I was creating as an adult. And it led to the creation of "Field Trip," the first smartphone app we created at Niantic. Field Trip uses Global Positioning System technology and a database of information about places to deliver cards containing interesting information about a user's immediate surroundings as she walks through the world. The app automatically surfaces these bits of educational and historical information, including local history, interesting landmarks, and works of art and architecture as a user moves through the world.

If we were walking by the Transamerica Building in San Francisco, for example, and passed a historical marker affixed to the building, Field Trip would show a card with the origin of our company name: the whaling ship, *Niantic*. This ship brought fortune-seekers to Yerba Buena – later renamed San Francisco – during the California Gold Rush in 1849. Run aground in the harbor and abandoned by its crew, the *Niantic* was converted into a storeship and hotel that would repeatedly catch fire and be rebuilt. Today's San Francisco Financial District is where the Niantic first ran aground, and remnants of the ship were excavated at the foot of the Transamerica Building in 1978. The *Niantic* serves as a wonderful metaphor for the types of hidden stories surfaced through our products: The knowledge exists – it just may not be always available to us.

In addition to maps, I've always enjoyed games, and like so many of my generation, writing code for games on cassette tapes that could be read by a TRS-80 eight-bit computer was a wonderful introduction to computer programming. And even before I started Keyhole, I worked on several of the first commercially available, internet-based massively multiplayer online games.

So it seems both logical and linear that my dual passions for mapping and multiplayer gaming would result in Niantic's second mobile app and first augmented reality game, Ingress. With Ingress, by building a game on top of the map data from Google Maps, we could combine gaming, walking, and exploring. An added motivation for me in developing Ingress and the Niantic platform was to help solve a common modern parenting issue with screen time. My oldest son, twelve at the time, shares my love of games. I knew that games got me into programming and I didn't want to take that away from him, but I also

wanted him to get out from in front of a game console and see the world around him.

We launched Ingress in November 2012, and today, the Ingress community is amazing, and continues to grow as we approach our four-year anniversary, with more than one million active players in 4,000 communities worldwide. In fact, when Pokémon GO launched in the United States, I was in Japan for an Ingress event, and it was our largest event ever, with more than 10,000 users.

The Lure, Lore, and Logistics of Pokémon GO

The popularity of Ingress among the gaming community, particularly in Japan, gave rise to the notion of combining the long-cherished Pokémon franchise with maps and AR technology.

If you think about the lore of Pokémon, you can understand why it worked well in an AR context. As depicted in the animated series, the player (called a "Trainer") goes out into the world searching for and capturing Pokémon. Through your device – your phone today and perhaps some kind of glasses or other devices in the future – you become the Trainer and can see this fantastical world of Pokémon overlaid on the real world. Pokémon GO is exactly what's depicted in the story of Pokémon, and a great example of bringing our innovations a little closer to our imaginations.

Much has been written and discussed about the PokéStops and Gyms you see in Pokémon GO, and it's worth sharing briefly how we decided their locations, which go back to the origins of Niantic Labs and the evolution and development of our earlier products. Many of the historical markers and other local landmarks from our first app, Field Trip, became significant game locations ("portals") in Ingress. While further developing Ingress, we thought about how to expand this set of interesting places that are public, visually recognizable, and appropriate places for people to visit. We asked Ingress players to submit their ideas for local landmarks they thought would be great additions to the game; millions of places were suggested, and a subset of those submissions (such as the Children's Museum in Brookings, South Dakota and the Kennedy Space Center Visitor Complex in Florida) was added to the existing set of points of interest to populate Pokéstops and Gyms in Pokémon GO.

Lessons Learned Along the Way

As with any new technology, the use of AR for gaming applications like Ingress and Pokémon GO has sparked many questions that have public policy implications here in the United States and globally. I look forward to answering your questions shortly, but let me highlight a few key areas:

Children's Online Privacy: Teen and adult players are the primary intended player base for Pokémon GO, but we recognize that the game will be of interest to some children under the age of 13 who have access to a smartphone. For this reason, we created a verifiable parental consent mechanism to comply with the Children's Online Privacy Protection Act ("COPPA"). Consistent with the requirements of COPPA, potential new users are asked to enter their birthdate in an age screen prior to signing up for the game. Potential players who enter a birthdate under age 13 are directed to the Pokémon Trainer Club, operated by The Pokémon Company International, and their parent is provided an email notice that they are interested in getting access to play Pokémon GO. A parent of an under-13 can work through the steps of the Pokémon Trainer Club to 1) create an online account; 2) provide certain forms of information to verify their identity; and 3) accept our Terms of Service and Privacy Policy.

The Pokémon Company International collects certain information from parents (such as name, date of birth, and certain information, such as a Social Security number) to obtain verified consent as required by COPPA. It does not share this information with Niantic. Additionally, parents have the option to provide certain personal information, such as their child's name, to The Pokémon Company International as part of the account sign up process; Niantic does not obtain this information.

A parent can always notify us to exercise their right to refuse collection, use, and/or disclosure of their child's personal information. And if we learn that an under-13 account was created without parental consent, that account and all other personal information collected in conjunction with that account will be deleted.

Data Integrity: Let me say up front that Niantic does not and has no plans to sell Pokémon GO user data – aggregated, de-identified or otherwise – to any third party.

Pokémon GO does collect and store certain information that interacts with various settings on the user's mobile device to provide core game functionality and improve Niantic's services. For example, the app collects and stores certain location information in order to show the Trainer on the map, and to trigger the resources, such as Pokémon, Pokéstops and Gyms that appear in her area. If a Trainer chooses to play with "AR" mode turned on, the app accesses the camera viewer in order to display the Pokémon "in real life" as you may have seen during the demonstration prior to the hearing. As you would expect, this information about the user's performance and activity is stored in connection with a user's account. The app also collects certain information to improve our services, and to facilitate important quality and stability objectives. For example, Niantic collects network provider information to allow for better quality geo-location.

The app collects information when it is open; there is no background collection of data in normal play mode. When the application is open, it disables the mobile device setting that automatically puts the phone to sleep when there has been no interaction by the user for a certain period of time. This is a key feature needed for Pokémon collection activities while a Trainer is moving around. When the user puts the phone to sleep manually, however (such as through pressing the power button), Pokémon GO goes idle[1].

User Safety and Intellectual Property: As I noted earlier, since the app was launched, Pokémon GO has been a target of numerous hacking efforts, including distributed denial of service attacks, unlawful data collection from our services, and monetization through the use of botnets and other devices.   We are concerned about these apps and services because in many cases they put our users at risk, and also because of the misuse of our intellectual property.

For example, a backdoored version of the game was found on a file repository service not long after the game was launched. Attackers also sought to lure potential Pokémon users to malicious sites that mimicked our own site, claiming users would be given additional features if they referred friends to the site,

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[1]A user may operate Pokémon GO in background mode if she has paired it with the Pokémon GO Plus wristband peripheral device made available by Nintendo. More information about that device is available here: http://www.pokemongo.com/es-es/pokemon-go-plus/.   When the user starts Pokémon GO using the device, she can play even when the app is running in the background, and it collects data in the same fashion as during normal game play.

which led to more spamming. We've also seen strains of malware masquerading as Pokémon GO-related apps.

In these cases, as in others, working internally and with our licensors and partners, we've been able to take certain malicious apps and sites down, but these challenges raise important questions about what technical and legal resources we have to combat efforts to misuse if not malign our intellectual property. It certainly underscores the need for review of existing laws to allow innovators to protect their intellectual property and systems from unauthorized use, particularly where the safety and security of users is at stake.

Conclusion: Where Will Augmented Reality Take Us?

Mr. Chairman, the most often asked question I now get can be expressed in two words: What's next? For us at Niantic, we're working on new sets of features for both Ingress and Pokémon GO, and planning for future titles. We enjoyed releasing some fun elements of gameplay for Pokémon GO tied to the Halloween weekend, and we look forward to additional releases to further enhance the game experience.

For the broader industry, tech leaders ranging from Apple's Tim Cook to Microsoft's Satya Nadella share my view that the potential of augmented reality far surpasses virtual reality. Indeed, we are already seeing the growth of new and interesting applications utilizing AR. An AR application (Pocket Patrol) is being piloted in Queensland, Australia to provide safety instruction to beach-goers. AR is already an education game-changer, with applications to help students learn anatomy, chemistry, math, and art. For example, the British Museum offers an AR scavenger hunt for kids to collect words and digital objects to solve puzzles as they scan specific exhibition objects with a mobile device. The Smithsonian Museum of Natural History here in Washington has a mobile app that overlays skin onto dinosaur skeletons when kids hold a mobile device over the bones.

AR is also increasingly becoming an important life-saving and -enhancing tool for public safety and first responders, and will be of even greater use as a dedicated mobile broadband network is built for the public safety and first responder communities.

For us at Niantic, seeing how the public has responded to Field Trip, Ingress and Pokémon GO inspires us to move forward to create and innovate, so we can continue to chase our imaginations. Similarly, it remains important for policy leaders like yourselves to have public policy keep pace with innovation. Properly utilized, public policy can play a central role in driving innovation as it has in Silicon Valley for the past forty years through government-led research and development in fields such as semiconductors, aerospace, and the internet.

Think of it, a mere 14 years ago, a mobile, augmented reality program required twenty-six pounds of equipment. Today, we can make it work with a smartphone that weighs a little less than half a pound. We at Niantic look forward to what the next fourteen years will bring to this amazing technology.

Thank you, again, Mr. Chairman and Senator Nelson, and I look forward to answering your questions, and more important, working with you to advance public policies that will further advance augmented reality.

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