April 28, 2017

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, District of Columbia 20554

RE: Notice of Ex Parte Communication, *Privacy of Customers of Broadband and Other Telecommunications Services*, WC Docket No. 16-106; *Public Safety and Homeland Security Bureau Seeks Comment on Request of the National Association of State 911 Administrators to Address Issues Related to 911 Applications for Smartphones*, RM-11780; *Streamlining Deployment of Small Cell Infrastructure by Improving Wireless Facilities Siting Policies*, WT Docket No. 16-421; *Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment*, WC Docket No. 17-84; *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment*, WT Docket No. 17-79; *Revising the Historic Preservation Review Process for Wireless Facility Deployments*, WT Docket No. 15-180

Dear Ms. Dortch,

On April 26, 2017, ACT | The App Association (the App Association) met with Rachel Bender, Acting Wireless Advisor to Chairman Ajit Pai at the Federal Communications Commission's (Commission's) headquarters in Washington, D.C., during which the App Association expressed views on the above-referenced active proceedings. In attendance on behalf of the App Association were: Chris Adams, Southern DNA; David Bain, TM Technologies; Joe Bonnell, Alchemy Security; Luke Chung, FMS, Inc.; Graham Dufault, the App Association; Gus Emery, Cosmic Innovations; Marc Fischer, Dogtown Media; Jeff Hadfield, 1564B; Tyler Leonard, Dogtown Media; Jad Meouchy, Remine; Brian Scarpelli, the App Association; Joel Thayer, the App Association; Scott Weiner, NeuEon; and Julie Yack, Colorado Technology Consultants.

In this meeting, the App Association described how it represents more than 5,000 app makers and connected device companies in the mobile economy. Organization members leverage the connectivity of smart devices to create innovative solutions that make our lives better. As the world has quickly embraced mobile technology, the hyper-competitive app ecosystem continues to produce more innovative and more efficient solutions that leverage mobile technologies to drive the global digital economy across modalities and segments, augmenting consumer interactions and experiences throughout their personal and work lives.

The app industry has been in existence less than a decade, and serves as the driving force behind the rise of smartphones and an ever-increasing number of internet-enabled devices. As we detail in our annually-released *State of the App Economy* report,[1] the app economy drives a thriving ecosystem worth more than $143 billion, led by U.S. companies, that has added 110,000 new software application developer jobs to the U.S. workforce over the last two years. Further, 83 percent of successful U.S. app companies are located outside Silicon Valley, many of which are in rural areas. The App Association additionally described how the mobile revolution is continuing to improve established industries like healthcare and manufacturing.

The App Association expressed its strong desire that the Commission reduce barriers for deploying new infrastructure as well as supporting innovative and more efficient ways to use wireless spectrum. As high speed wireless broadband availability is essential for the app economy to continue growing, failure by the Commission to meet these infrastructure and spectrum needs will harm the economy and consumers. 5G network and small cell deployments are expected to create 3 million new jobs and boost annual U.S. gross domestic product by $500 billion, driven by a projected $275 billion investment from telecom operators.[2] The App Association applauded the Commission's recent steps taken in a variety of dockets noted above that will examine ways to remove as many regulatory barriers as possible to advance more 5G deployment. U.S. infrastructure is in need of repair and improvement, and the App Association believes that the Commission should play a central role in driving the deployment of a robust internet infrastructure.

The App Association also discussed its views regarding the privacy of customers of broadband and other telecommunications services. The App Association explained that, due to the Commission previously declaring internet service providers (ISPs) as common carriers, the rules—a by-product of that declaration—effectively moved ISP privacy regulation out of the Federal Trade Commission's (FTC's) jurisdiction, introducing legal uncertainty into the small business innovation community. Given the recent decision by Congress regarding Section 222 and overturning the aforementioned change, the App Association reiterated that, if the Commission moves forward to promulgate new privacy rules, such rules be aligned as closely as possible with the approach the FTC takes in protecting consumer privacy.

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[1] ACT | The App Association, *State of the App Economy, Fifth Edition* (Apr. 2017), *available at* http://actonline.org/2017/04/20/state-of-the-app-economy-report-outlines-growth-dynamism-of-the-app-ecosystem/.

[2] Accenture, *Smart Cities: How 5G Can Help Municipalities Become Vibrant Smart Cities* (Jan. 2017), *available at* https://newsroom.accenture.com/content/1101/files/Accenture_5G-Municipalities-Become-Smart-Cities.pdf.

Lastly, the App Association discussed its views regarding the Commission's Public Notice (PN) on the request of the National Association of State 911 Administrators (NASNA) to Address Issues Related to 911 Applications for Smartphones.[3] Consistent with our views submitted to the record, we emphasized that the FTC is the appropriate authority to address the concerns raised by NASNA. Although we are sensitive to the concerns NASNA expresses in its letter, the Commission is not the appropriate venue to handle such concerns. We further suggested that the Commission first engage in a thorough analysis addressing its legal authority over this issue, along with its existing "unequivocal…declar[ation] that it has no intent to regulate edge providers," before moving forward on this proceeding.[4] We explained that an established path for redress already exists for the concerns raised by NASNA and other like-minded commenters in this docket. The FTC – not the FCC – is the proper venue to address apps and related consumer harms generally, as well as for the specific complaints outlined in NASNA's letter to the outgoing Chairman.

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[3] *Public Safety and Homeland Security Bureau Seeks Comment on Request of the National Association of State 911 Administrators to Address Issues Related to 911 Applications for Smartphones*, Public Notice, DA 16-1405 (rel. Dec. 19, 2016).

[4] *In the Matter of Protecting and Promoting the Internet*, 30 FCC Rcd. 5601, GN Docket No. 14-28, Report and Order, at Para. 382 (2015) (writing "[the Commission is] not, however, regulating the Internet, *per se*, or *any Internet applications or content*. Rather, our reclassification of broadband Internet access service involves only the transmission component of Internet access service." (Emphasis Added)); *see also In the Matter of Consumer Watchdog Petition for Rulemaking to Require Edge Providers to Honor 'Do Not Track' Requests*, DA-15-1266, RM-11757, Order, at Para 1 (2015) (writing "[t]he Commission has been unequivocal in declaring that it has no intent to regulate edge providers.").

Pursuant to the Commission's rules,[5] this ex parte notice (with meeting materials appended) is being electronically filed via the Commission's Electronic Comment Filing System and a copy of this submission is being provided electronically to the meeting attendees.

Sincerely,

___/s/_____

Brian Scarpelli
Senior Policy Counsel
ACT | The App Association

Joel Thayer
Associate Policy Counsel
ACT | The App Association

Attached: ACT | The App Association's *State of the App Economy, Fifth Edition*

[5] 47 C.F.R. § 1.1206.

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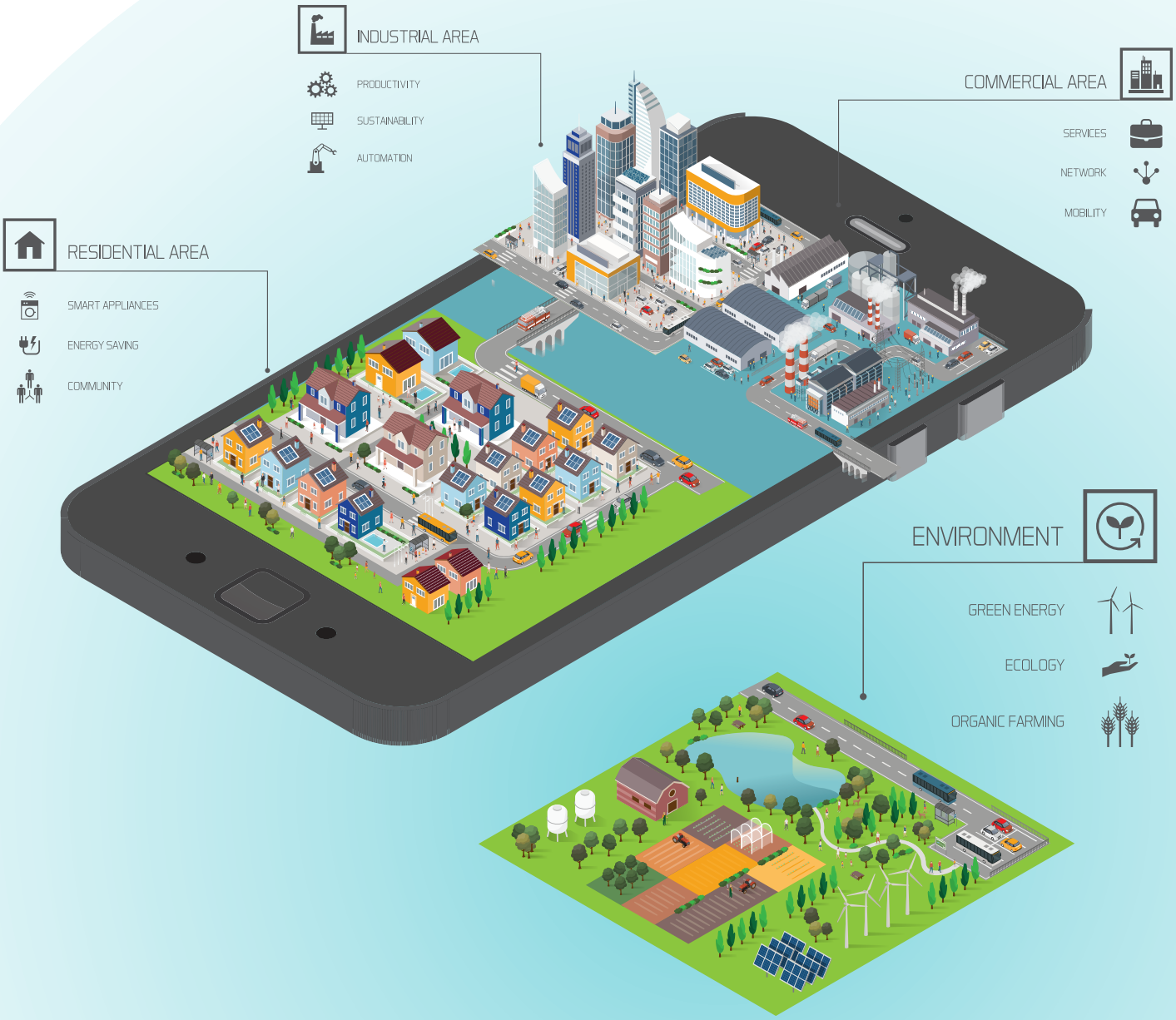
State of the App Economy

Fifth Edition



Brian Scarpelli, Nick Miller, Roya Stephens
Illustrations by Eric Gagnier

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BACKGROUND & SUMMARY

In the decade since Apple released the first iPhone, smartphones went from being a cool toy for the tech savvy to the most powerful and distributed computing platform in the world. The innovation and creativity of app developers, from every nook and cranny of America, fueled this mobile revolution which continues to transform our daily lives and touch every sector of the economy in every U.S. congressional district.

Five years after ACT | The App Association's first App Economy Report, the industry continues to thrive. Four key findings are:

- **$143 Billion** – Today, the app economy is part of a thriving ecosystem worth more than $143 billion,[i] led by U.S. companies.
- **110,000 New Jobs Created** – From May 2014[ii] through May 2016,[iii] the app economy added 110,000 new software application developer jobs to the U.S. workforce.
- **83 Percent of Top App Companies Located Outside Silicon Valley** – The vast majority of successful U.S. app companies are located outside Silicon Valley, many of which are in rural areas.
- **500,000 Computing Jobs Remain Unfilled**[iv]– The mobile revolution is continuing into established industries like healthcare and manufacturing.

The app economy has evolved far beyond social media and games found in app marketplaces. Today, every industry benefits from enterprise or consumer-facing mobile software components. Without mobile apps, the $8 trillion[v] internet of things (IoT) revolution would not exist. This encompassing concept, where everyday products use the internet to transmit data collected through sensors, will rely upon the app economy's continued innovation, investment, and growth.

$143
billion ecosystem

500,000
computing jobs unfilled

83%
are outside of Silicon Valley

110,000
software jobs added to the U.S. workforce

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THE APP ECONOMY:
TRACKING THE LAST FIVE YEARS OF DYNAMIC GROWTH

Since 2012, the App Association has been tracking the development of the app economy, which has grown from a $20 billion industry in 2012,[vi] to a $143 billion ecosystem today. The evolution of this industry has shifted our broader economy from one that was fixed and PC-centered, to one that is mobile – in more ways than one. In addition to the widespread adoption of mobile communications devices like smartphones and wearables, the increasing connectivity of previously "dumb" devices presents a massive opportunity for businesses. Remarkably, the 350 million connected devices in our country currently outnumber the U.S. population. It is currently estimated there are 8.4 billion connected devices globally,[vii] allowing companies to leverage groundbreaking opportunities in artificial intelligence (AI) analytics and permanently alter every industry from manufacturing to healthcare.

The app economy continues to exhibit strong growth, especially as apps now represent the primary means for accessing products and services in both the consumer and enterprise contexts. App downloads reached more than 90 billion in 2016,[viii] and the broadening popularity and adoption of apps has led to increased revenue and customer bases for app makers across the United States. This steady growth has resulted in direct revenues hitting $51 billion in 2016, with a projection that those revenues will reach $100 billion by 2020.[ix]

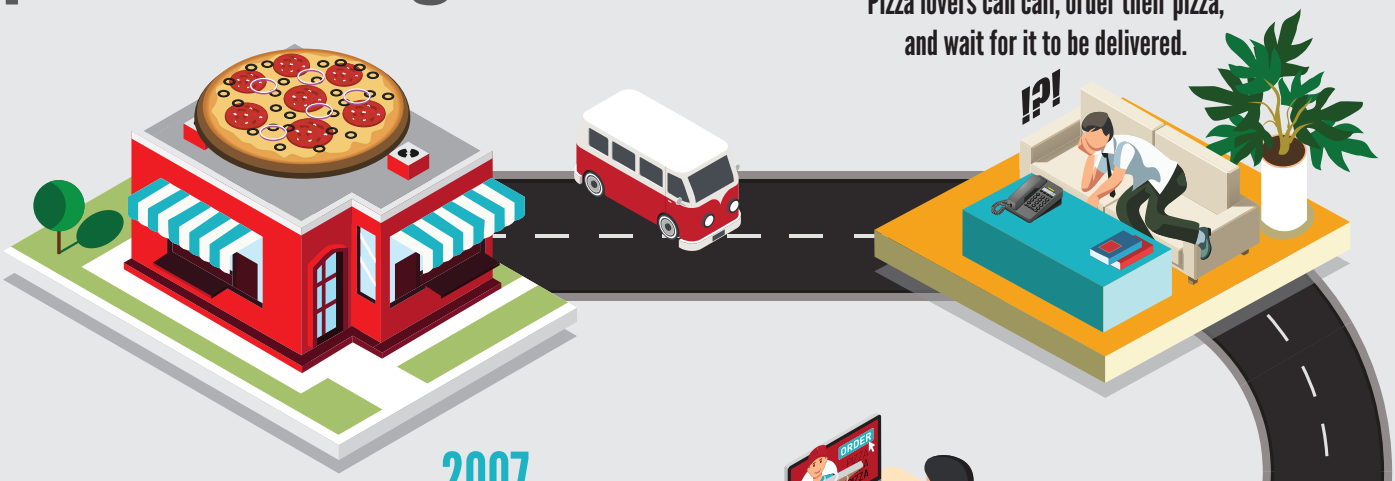
The growth of the app economy has brought even the most traditional companies, like **Domino's Pizza**, into the mobile age. Increased connectivity and accessibility of apps has sparked an evolution in business models and simplified the ways customers receive products and services. From farming to pizza delivery, apps are innovating the way we live.

The app economy is stronger than ever and shows no signs of slowing. Because apps are the gateway to the burgeoning IoT, this is just the tip of the iceberg.

Apps: Delivering Innovation

1960

Domino's first opens their doors.
Pizza lovers can call, order their pizza,
and wait for it to be delivered.

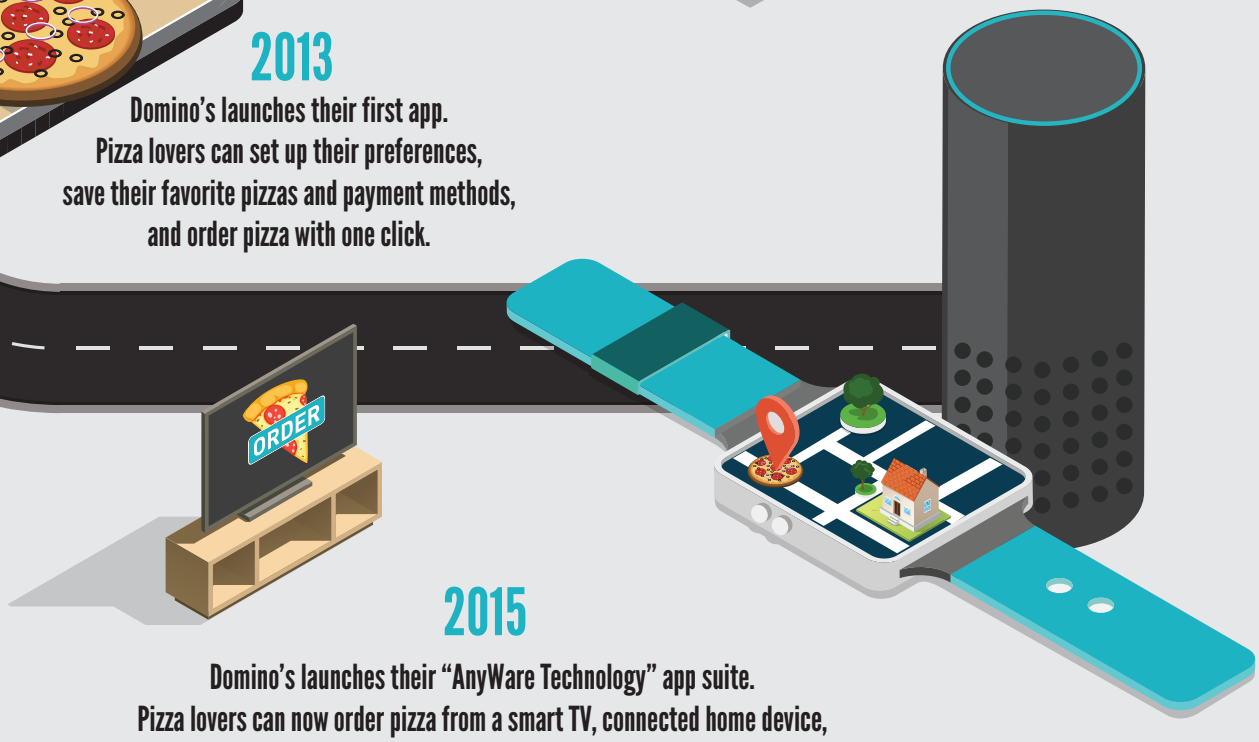


2007

Domino's introduces online ordering.
A few years later they add a feature for
pizza lovers to track the progress of their pizza.

2013

Domino's launches their first app.
Pizza lovers can set up their preferences,
save their favorite pizzas and payment methods,
and order pizza with one click.



2015

Domino's launches their "AnyWare Technology" app suite.
Pizza lovers can now order pizza from a smart TV, connected home device,
connected car, social media, or the Domino's app. Their pizza tracker is accessible on
wearable devices like smart watches, and ordering can be as simple as texting the pizza emoji.

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JOBS

The app economy has created employment opportunities for people in all parts of the country, with a variety of skill sets. From engineers who code to marketing and sales experts, white-collar and blue-collar workers alike are turning to the app economy. According the Bureau of Labor Statistics, the app economy added more than 110,000 software application developer jobs to the U.S. workforce between May 2014[x] and May 2016,[xi] and these jobs have a significant multiplier effect. For every high-tech job, five additional jobs were created in local communities[xii] across the United States. These opportunities are found in rural and urban settings across the country; nearly nine out of ten software developers live outside of Silicon Valley.[xiii]

ProjectHosts, a company dedicated to providing secure cloud apps for healthcare and government clients, started the OnRamp Training Program to develop and hire cloud technologists. Based in Conneautville, Pennsylvania, OnRamp provides a fully paid apprenticeship and takes applicants through a 90-day training and evaluation period, testing their abilities to master the programming skills needed to be successful at the company. At the end of the apprenticeship, applicants are evaluated, and if they pass, ProjectHosts will bring them on as full-time employees with a competitive salary. With limited talent available in this rural enclave, ProjectHosts is exploring new avenues to create the necessary workforce to support their company's growth, while providing high quality, well-paying jobs in their local community.

The app economy is particularly starved for skilled workers with computer science training, even though the average salary for developers – one of the most critical positions in any software company – is $102,160.[xiv] Only one in four K-12 schools teach computer science, leaving three-quarters of American students ill-equipped to enter the modern workforce. At present, more than 500,000 computing jobs are unfilled,[xv] and by 2024, there will be more than 1 million unfilled computing jobs. The United States must fund educational curriculum, from primary to post-secondary, to address the shortage of American computer science talent.

3 *out of* 4

kids **DON'T** have the opportunity to study computer science

Right now there are more than

500,000

unfilled computing jobs

There will be more than

1 MILLON

unfilled jobs by 2024

Average salary is

$102,160

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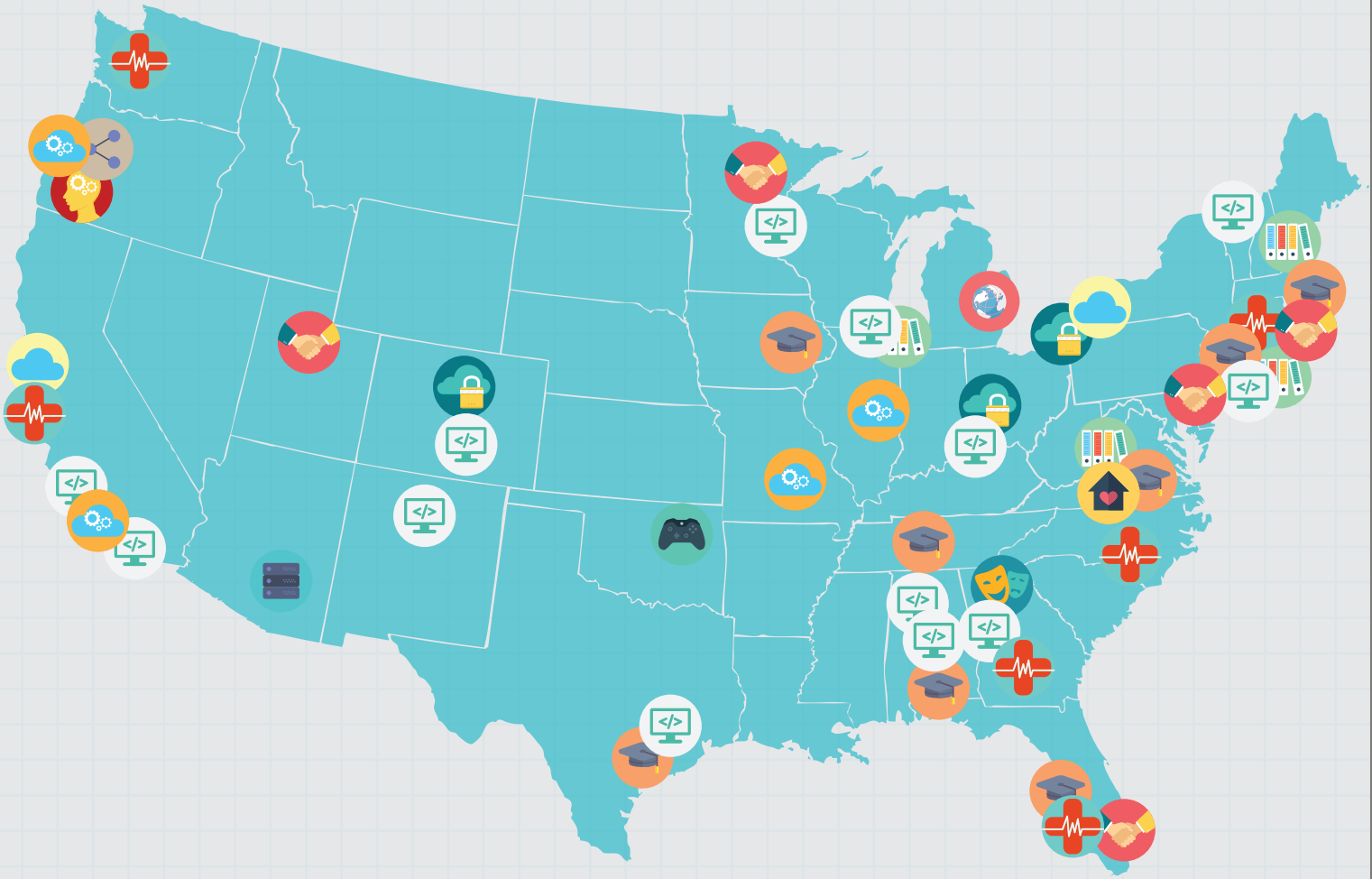
GEOGRAPHY

Startups and small businesses from every corner of the United States, and all 435 congressional districts, help drive the $143 billion global app ecosystem. Distributed cloud computing has enabled the founding of companies and allowed for a distributed workforce anywhere in the United States. By allowing access to data anywhere, at all times and at a reduced cost, cloud computing has fundamentally altered how we go to work.

As a result of this ubiquitous connectivity, 83 percent of top app companies are businesses located outside Silicon Valley. Significantly, this growth even extends to rural areas, where 13 percent of top app companies are headquartered.

The States of the App Economy



The legend identifies just a few segments of the app economy, driving growth in cities, towns, and suburbs across America. This map illustrates both a diversity of interests and a variety of App Association members, in all corners of the country.

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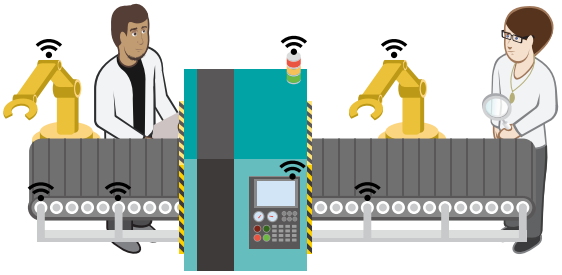
USE CASE: MANUFACTURING

Representing nearly one-fifth of U.S. gross domestic product,[xvi] manufacturing is a cornerstone of the U.S. economy, providing $1.81 in value for every $1.00 spent.[xvii] While growth in the manufacturing industry has faced challenges in the United States, apps play an important role in the solution.

American manufacturing must incorporate the efficiencies offered by the app economy to remain competitive with other nations. The emergence of app-driven industrial IoT tools, which collect and analyze data gathered by sensors in real time, enables factory workers to respond immediately, preventing disruptions in production.



Swisslog's "SmartLIFT" technology creates an indoor, localized GPS network to aggregate data from sensors on forklifts and directional barcodes placed around the warehouse.[xviii] Warehouse managers can access these analytics through their tablets or mobile phones to optimize productivity and receive real-time, unassailable inventory reports. Bobcat, an equipment company based in North Dakota, deployed Swisslog's technology in its warehouses and reported a 30 percent increase in pallets per hour "with no inventory errors."

Apps' increasing integration into manufacturing directly impacts a company's entire workforce. The real-time linkage of inventory with sales and manufacturing in a connected environment streamlines production, speeds time to market, and increases competitiveness throughout the industry. As the manufacturing industry evolves, more American jobs, and strong computer science education training, will be needed to support these improvements.

Micro-breweries often implement technology into the initial heating and cooling process of brewing and in shipping procedures, to ensure consistency across product and delivery. This automation encourages the development of new American jobs to support these improvements to process.

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USE CASE: HEALTHCARE

Connected technology has the potential to radically change and improve the American healthcare system, and no segment of the economy needs this more. However, the current environment does not adequately leverage the opportunities of connected health technology. According to Centers for Medicare and Medicaid Services, nearly $1 trillion was reimbursed for Medicare and Medicaid, yet only $14 million was paid out for "telehealth" services,[xix] representing a microscopic .0014 percent of total reimbursements.

As 60 percent of the population already uses mobile apps to help track their medical conditions and make informed choices about their health, mobile app-enabled telehealth and remote monitoring of patient-generated health data can improve quality care while lowering healthcare costs.

Consider the aging population of the United States: by 2050, there will be 83.7 million Americans over the age of 65, twice as many as in 2012.[xx] Eighty percent will have at least one chronic condition.[xxi] With a large number living in rural areas, the age group's rapid growth will severely strain public and private health resources. The promise of connected health would allow more people to live longer at home, happier and healthier.

To address this need, the App Association founded the Connected Health Initiative (CHI), a dedicated effort to represent a broad consensus of stakeholders across the healthcare and technology sectors to better apply the contributions of connected technology throughout the American healthcare system.[xxii] One of CHI's member companies, **University of Mississippi Medical Center**, has used technology to reduce costs by roughly $2 million a month from their eICU program and reduce readmissions for diabetes by 100 percent.[xxiii]

Connected Health Market

PATIENT

Patients use apps like **CareSync** to keep track of their medical records, receive and send necessary health information quickly and securely, and improve their overall care.

DOCTOR

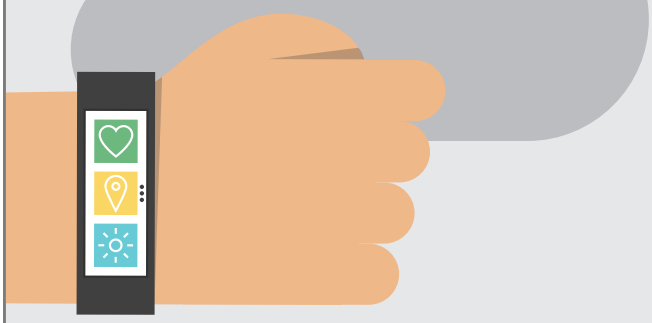
Doctors use apps like **Rimidi** to streamline the treatment process. With Rimidi's technology, doctors can more efficiently treat patients with diabetes, and patients can better monitor and engage with their own care.

HOSPITAL

Companies like **Stroll Health** help doctors make better and more effective referrals for patients. Their streamlined process allows doctors to refer their patients to additional in-network services close by, so they may receive treatments more quickly at less cost.

HOME

Patients can use connected devices like **ResMed's AirSense™ 10 CPAP** to monitor their breathing at home. Physicians can use data collected from these connected devices to better understand their patients' sleeping and breathing patterns and more effectively treat them.



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BEYOND THE OBVIOUS

Just a few years ago, apps were merely considered consumer products, but the app ecosystem has heeded changes in market demand, international competition, and industry needs to open huge opportunities for the future of the app economy. Increasingly, apps provide a product and an interface to enable real-time access to a seemingly infinite amount of data. This access drives the creation and growth of business models that rely on shared machine learning and scalability.

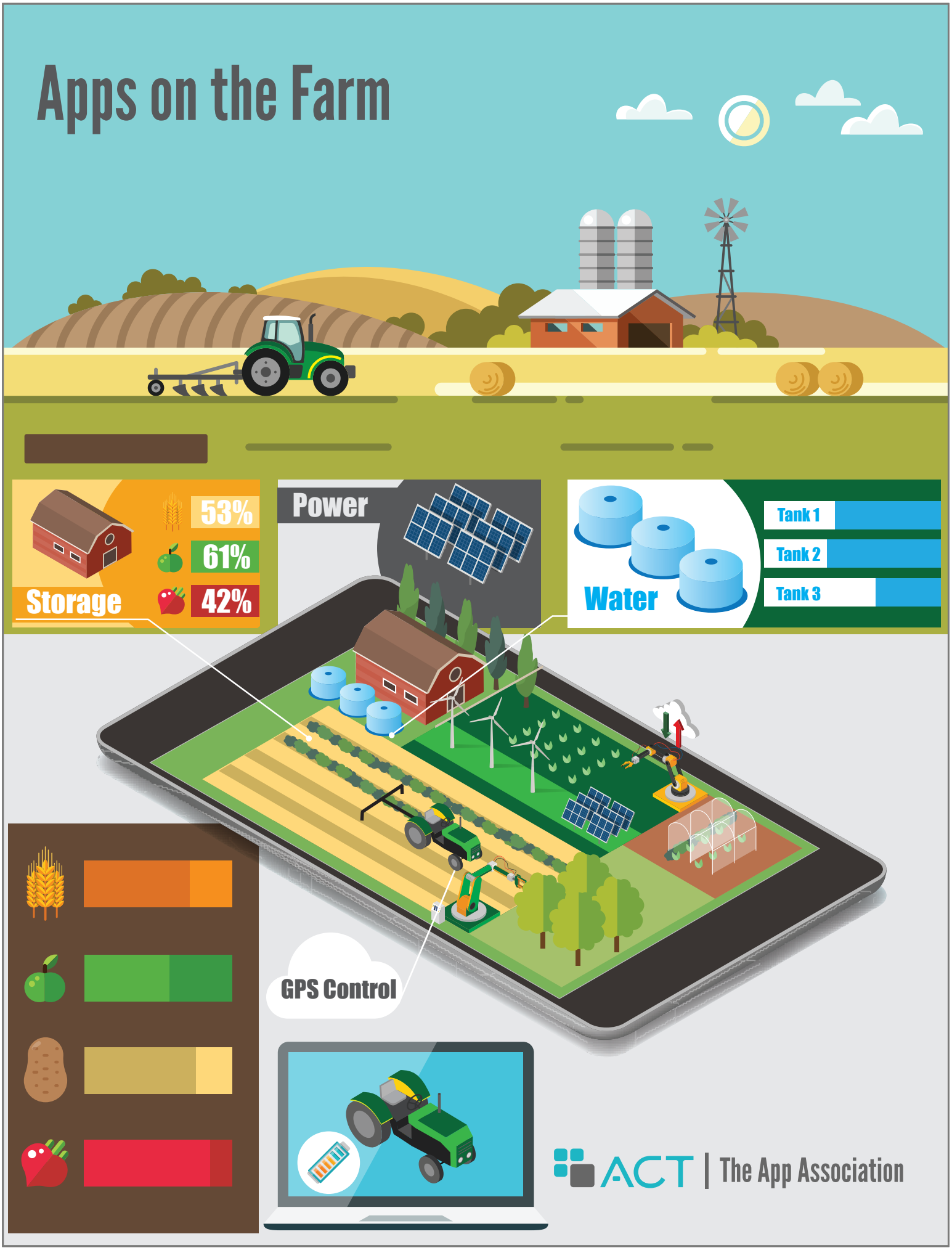
Located in Falls Church, Virginia, **Remine** provides a technology platform that utilizes big data to help real estate agents predict a homeowner's propensity to buy, sell, or refinance their home. By aggregating property records, transactional history, and consumer data, Remine is using the power of big data to change the game in real estate.

The "crowd-sourced" innovation that has begun to take root around IoT is attributable to the interfaces apps provide, and is integral to the development we will see in years to come.

Interknowlogy, based in Carlsbad, California, has created apps being used in unexpected ways, including bringing politics into the 21st century. Partnering with the state of Iowa and using Microsoft's Azure cloud computing platform, Interknowlogy created an app which helped precincts report 90 percent of the results of the 2016 Iowa caucus in a secure, accurate manner. The utility brought by apps like these and partnerships with political and government entities could streamline and change the way we vote forever.

The app economy is driving the IoT revolution across industries, even farming. Increasingly, farmers rely upon apps and connected devices to more efficiently use water and other inputs and discern the best times to plant and harvest. Tractors come equipped with GPS-enabled mechanisms to steer the tractor and make sure farmers can avoid gaps or overlaps in planting, while tracking how much seed and nutrients they apply to a particular field.

Apps on the Farm



WHERE ARE APPS HEADED?

2016 was a transition year for the app ecosystem. Apps stores continued to be the primary location for people to get apps, but the power behind the applications has moved almost entirely to the cloud – and the large data stores that reside there.

So what are the three biggest future trends in the app ecosystem?

- **Apps Driven by Big Data Will Lead the Way** – Sure, games will continue to exist, but the way we engage in enterprise, shopping, health, dating, business, manufacturing, and finance activities will not just be built around machine learning, but the apps you use to interface with the cloud will be sending back key data in real-time. Mobile apps will be more than just the portal to your data, they will be a key instrument in utilizing it.
- **Everything is a Sensor** – Sensors of every imaginable type are becoming more affordable and accessible. Look for developers to improve software and use the sensors on your phone and wearables in new ways (you think your camera can only take photos? Think again!). All of the data will flow back to the cloud to power AI.
- **Cybersecurity Enters the Consumer Worldview** – Those of us in tech have been talking about cybersecurity, cross-border data flows, encryption, and one-way hash for decades. But it's still on the periphery of consumer consciousness. Mobile apps are now powering AI, accessing your money and medical records, while sensors gather information in real time. Your life is in your apps. The ability to see data, and impact your monetary or physical health, makes the security of your apps paramount.

If these predictions ring true, then the app industry will need Congress and regulatory agencies to ensure clear rules of the road that preserve innovation. Clarity around law enforcement access to data will be critical, as will industry best practices around privacy and security, moving from one-time consent models to more interactive collection and use. Finally, we will need to ensure that the infrastructure to support our "always-mobile, always-on" life continues to improve. Without 5G, sensors, and AI, we cannot deliver the promise the next wave of technology holds for all Americans.

METHODOLOGY

ACT | The App Association's State of the App Economy report is based on a combination of original research and publicly available data from the Apple App Store, Google Play, government agencies, company statements, and industry publications.

Analysis of Top App Companies – The App Association surveyed more than 500 top grossing apps across a range of categories in the Apple App Store and Google Play, the two largest app markets. A detailed analysis was conducted on each publisher to determine the greatest influences on growth and success in the app economy. For the purposes of this study, the small company designation coincides with the Small Business Administration's Table of Small Business Size Standards Matched to North American Industry Classification System Codes.[xxiii]

Job Creation & Open Job Analysis – These data points are based on analysis of data from the Bureau of Labor Statistics and Glassdoor.com.

The App Association represents more than 5,000 app makers and connected device companies in the mobile economy. Organization members are industry leaders and new entrants innovating to improve productivity, accelerate learning, deliver entertainment, and promote healthier lifestyles.

ACT | The App Association regularly conducts research and publishes reports on the mobile ecosystem. It is the leading resource on app industry growth, providing guidance on market strategy, global commerce, regulated industries, privacy and security, and intellectual property.

End Notes

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[xiii] "Six-Figure Tech Salaries: Creating the Next Developer Workforce," ACT | The App Association (August 2, 2016). Available at: http://www.arcgis.com/apps/MapJournal/index.html?appid=b1c59eaadfd945a68a59724a59dbf7b1

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[xv] "Code.org 2016 Annual Report," Code.org (February 9, 2017). Available at: https://code.org/about/2016

[xvi] "Industry Data," Bureau of Economic Analysis (April 19, 2017). Available at: https://www.bea.gov/iTable/iTable.cfm?ReqID=51&step=1#reqid=51&step=51&isuri=1&5114=q&5102=15

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[xix] "CMS Medicare Reimburses Nearly $14 million for Telemedicine in 2014," Center for Telehealth & e-Health Law (May 8, 2015). Available at: http://ctel.org/2015/05/cms-medicare-reimburses-nearly-14-million-for-telemedicine-in-2014/

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