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Congress of the United States
U.S. House of Representatives
Committee on Small Business
2361 Rayburn House Office Building
Washington, DC 20515-6315

To: Members, Subcommittee on Health and Technology
From: Committee Staff
Date: July 20, 2015
Re: Subcommittee Hearing: *"Modern Tools in a Modern World: How App Technology is Benefiting Small Businesses"*

On Thursday, July 23, 2015, at 10:00 a.m. in Room 2360 of the Rayburn House Office Building, the Small Business Subcommittee on Health and Technology will convene for a hearing to examine the increasing utilization of applications[1] technology and the implications for small American businesses, particularly in underserved regions of the country. The hearing will examine how apps improve businesses' day-to-day operations, increase efficiency, assist their marketing and outreach capabilities, and, ultimately, stimulate revenue and job growth. The hearing will provide Members with the opportunity to hear from small businesses that are at the forefront of these technological advances, the potential economic benefits that may arise from widespread adoption of mobile device applications to remotely control other machines, and the potential barriers to growth and development of this innovative technology.

I. The Application Economy

The growing popularity of wireless devices has led to an explosion in the app industry. Recent reporting from Cisco indicates that the United States' demand for mobile data grew by 63 percent in 2014 and is expected to increase sevenfold by 2019, an annual compound rate of 47 percent.[2] According to experts, there have been more than 750,000 app economy jobs created in the United States since 2007.[3] Furthermore, the app industry is dominated by small businesses as greater than 75 percent of the highest grossing apps are produced by startups and small firms.[4] APPNATION findings predict that the app economy will reach $151 billion by 2017.[5]

The astounding growth of the app economy is complementary to small business and entrepreneur objectives – both as producers and consumers. Many analysts believe that entrepreneurs lead in

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[1] An "application" or "app" (the terms are used interchangeably) is a piece of a software program intended to be used on a mobile device. *See In Re: Matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of the Competitive Market Conditions with Respect to Mobile Wireless, Including Commercial Mobile Services*, WT Docket No. 09-66, 25 FCC Rcd 11,407, 11,502 n. 454 (2010) (internal citations omitted).

[2] http://www.cisco.com/c/dam/assets/sol/sp/vni/forecast_highlights_mobile/index.html#~Country.

[3] http://www.progressivepolicy.org/slider/752000-app-economy-jobs-on-the-5th-anniversary-of-the-app-store/.

[4] *See* JONATHON GODFREY & COURTNEY BERNARD, ACT |THE APP ASSOCIATION, STATE OF THE APP ECONOMY 2014 (2014), *available at* http://actonline.org/wp-content/uploads/2014/10/State-of-App-Economy-web.pdf.

[5] http://appnationconference.com/main/research/.

the development of innovative apps that are revolutionizing the utilization of technology by businesses and consumers due to their ability to remain flexible in a quickly changing market environment.[6]

II. Small Business Entrepreneurship and Innovations in the App Industry

A recent report estimates that one trillion devices and machines may be connected to the Internet across the globe by 2025.[7] This is estimated to have a global economic impact of approximately $36 trillion.[8] Applications designed for consumers use varies widely. Developers are producing apps that integrate home automation systems, track and monitor health statistics, offer budget and financial transaction tools, and more. Consumers utilize these apps to have their groceries purchased and delivered by Instacart or have their clothes washed by Washio.[9]

Additionally, a Pew Research Center report noted that 62 percent of smartphone owners have used their phone to track their health, conduct online banking, and find more information about jobs.[10] Interestingly, the report also observes that "fully 18 percent of smartphone owners overall have submitted a job application via their mobile device, and among those whose household income is less than $30,000, that share is substantially higher, at 32 percent."[11]

These extensively used app platforms are being developed by small scale entrepreneurs. A survey of the top grossing apps indicate that 77 percent of apps are made by startups or small companies and nearly 80 percent of those companies in the United States are outside of Silicon Valley.[12] Moreover, these firms producing apps are selling their product worldwide; for instance, over 20 percent of applications available in the China App Store were created by American companies.[13]

III. App Technology Implications for Underserved Regions

A. App Development and Small Business in Underserved Regions

Small business opportunities are not unique to major metropolitan regions of the United States. An industry study claims geographic diversity is prevalent among the top domestic app

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[6] Godfrey & Bernard *supra* note 4, at 3.

[7] MCKINSEY GLOBAL INSTITUTE, DISRUPTIVE TECHNOLOGIES: ADVANCES THAT WILL TRANSFORM LIFE, BUSINESS AND THE GLOBAL ECONOMY 5 (2013) [hereinafter McKinsey Report], *available at* http://www.mckinsey.com/insights/business_technology/disruptive_technologies.

[8] *Id.* It is important to note that the economic impact estimated by McKinsey involves industrial, public sector, and health care providers' use of devices interconnected through Internet and controlled by mobile device applications. *Id.* at 6. Since the McKinsey Report does not include consumer utilization of this interconnectedness, the overall global impact may be significantly larger. There also are some significant caveats to the McKinsey report, including that the dollar value does not have a time frame estimate. Furthermore, by way of comparison, the total gross world product (aggregation of individual country gross domestic product) for 2012 was about $71.62 trillion. https://www.cia.gov/library/publications/the-world-factbook/geos/xx.html.

[9] http://www.economist.com/news/briefing/21637355-freelance-workers-available-moments-notice-will-reshape-nature-companies-and.

[10] PEW RESEARCH CENTER, U.S. SMARTPHONE USE IN 2015 (2015), *available at* http://www.pewinternet.org/files/2015/03/PI_Smartphones_0401151.pdf.

[11] *Id* at 20.

[12] Godfrey & Bernard *supra* note 4, at 2.

[13] *Id* at 2.

developers.[14] The report also contends that this is largely in part because the industry poses few restrictions on developers new to the industry.[15] Nearly one-third of the top United States app companies are located in the South and Midwest regions of the country.[16] Farming regions across the United States are spurring new software development platforms. For example, OnFarm – a startup business from Fresno, California – has created a connected application platform that aggregates and analyzes countless data related to weather systems, soil, and other sources that assists growers' farming operations.[17]

It is increasingly important for small businesses to develop and promulgate app offerings for their consumer base, as well. Last year, Forbes claimed that small businesses that build their own apps support brand recognition efforts and improve customer interactions.[18]

B. App Utilization in Underserved Regions

In addition to playing an important role in the development of wireless innovation, small businesses are benefitting by utilizing these new products.[19] A recent study states that the emergence of apps and mobile devices helps firms directly engage with their customers to improve productivity and services.[20] The study also estimates that users will interact with more than 100 apps per day, generating more than $77 billion in revenue for that industry. It goes without saying that mobile apps will play an ever-increasing role in overall economic growth.[21]

As mentioned previously, farmers are using wireless technology to monitor soil conditions to pinpoint the most productive areas of their farms.[22] For instance, there are over 3,000 dairy farmers – managing 1 million head of cattle – using the Farmeron app, a cloud-based program that tracks, operations, animal purchases, and milking data.[23] Managers in the transportation and logistics industries utilize tracking sensors accessed by both mobile and non-mobile devices to provide real-time status on shipments and improve delivery efficiency (which reduces, among other things, fuel consumption).[24] Furthermore, small businesses anywhere in the country can download and access apps like Square, Inc., which converts smartphones into a mobile credit card reader.[25] The app effectively replaces the need for cash registers, while it also tracks inventory, issues digital receipts to customers, and enables merchants and customers to seamlessly interact.

C. Challenges to the Applications Industry

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[14] Godfrey & Bernard *supra* note 4, at 9.
[15] *Id.*
[16] *Id.*
[17] http://www.greenbiz.com/blog/2013/10/25/onfarms-recipe-smarter-field-management.
[18] http://www.forbes.com/sites/allbusiness/2014/11/17/heres-why-your-business-needs-its-own-mobile-app/.
[19] *Id.*
[20] http://www.gartner.com/newsroom/id/2654115.
[21] *Id.*
[22] http://www.washingtonpost.com/sf/brand-connect/wp/2013/03/11/u-s-farmers-grow-wireless/.
[23] http://www.mnn.com/green-tech/gadgets-electronics/stories/farming-theres-an-app-for-that.
[24] http://www.zdnet.com/the-business-benefits-of-machine-to-machine-7000008924/.
[25] http://www.cnet.com/news/square-register-app-now-available-to-small-businesses-around-the-world/.

Although the applications industry is booming, it is not free of challenges. Many of the devices which applications operate on could face regulatory barriers from various federal, state, and local governments, depending on the size, scope, and use of the product because wireless devices depend on utilization of both licensed[26] and unlicensed[27] spectrum to communicate and operate their devices efficiently. The Federal Communications Commission (FCC) assigns spectrum by frequency bands for certain services, such as public safety, broadcasting, radio, and unlicensed services.[28] As demand for wireless devices and services increase, those unique frequency bands used by wireless devices may become crowded, which causes either interference among devices or slow transmission of data, or a combination of both.

Additionally, resource misallocation and profit acquisition continues to be problematic for app developers. A recent study of the app economy notes that, "despite the enormous revenue opportunity offered by mobile e-Commerce only 9 percent of developers are using that revenue model…there's a big gap in the market."[29] Many developers are focused on app store revenues which tend to be negligible in comparison to the subscription applications model, which is the fastest growing component of the app economy.[30]

Another potential hurdle for app developers and consumers is the functional design of the program. The FCC sets the standards and regulates communication devices, including Part 15 devices,[31] while other federal agencies establish regulations specific to industries within their jurisdiction. For example, the Food and Drug Administration regulates wireless medical devices,[32] including medical apps,[33] to maintain the safety and protection of the individual users. The United States Highway and Transportation Safety Administration establishes the standards for vehicle-to-vehicle communications technology, including the development of autonomous vehicles.[34] In addition, the Federal Aviation Administration regulates the use of unmanned aerial

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[26] Licensed spectrum is defined as the portion of spectrum that is specifically licensed and regulated by the Federal Communications Commission (FCC) to a specific entity or carrier. Some licensed frequencies can be shared, leased, or transferred. http://www.fcc.gov/encyclopedia/accessing-spectrum.

[27] Unlicensed spectrum is defined as the part of the spectrum that does not require a license to operate and allows sharing with licensed services. http://www.fcc.gov/encyclopedia/accessing-spectrum.

[28] The FCC is the federal agency responsible for managing non-federal spectrum to ensure that all wireless communications can co-exist. The National Telecommunications and Information Administration (NTIA), within the Department of Commerce, is responsible for managing spectrum owned by the federal government.

[29] MARK WILCOX & CHRISTINA VOSKOGLOU, VISIONMOBILE, DEVELOPER ECONOMICS Q1: STATE OF THE DEVELOPER NATION (2015), *available at* http://www.visionmobile.com/product/developer-economics-q1-2015-state-developer-nation/.

[30] *Id* at 39.

[31] 47 C.F.R. Part 15. The FCC has rules, known as Part 15 rules, to limit the potential for harmful interference by low-power non-licensed transmitters. Part 15 rules cover both products that unintentionally and intentionally emit radio frequency, including devices that may share licensed or unlicensed spectrum. Small technology manufactures must ensure that their innovative products meet the FCC Part 15 compliance standards and do not cause interference. Examples of Part 15 devices include remote control cars, garage door openers, and wireless microphones.

[32] http://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/ConnectedHealth/WirelessMedicalDevices/default.htm.

[33] *Mobile Medical App Entrepreneurs: Changing the Face of Health Care: Hearing Before the Subcommittee on Health and Technology of the Committee on Small Business,* 113th Cong., 1st Sess. (2013), *available at* http://smallbusiness.house.gov/uploadedfiles/6-27-2013_memo.pdf.

[34] http://www.nhtsa.gov/About.

vehicles (UAVs), which many farmers see as a revolutionary product.[35] As these new industries are complex and dynamic in nature, it is important for regulators to strike a balance that offers necessary consumer protections, but does not impede innovation and economic opportunity.

D. Conclusion

The applications industry is growing at an impressive rate and the app economy will continue to become more efficient as the market matures and small businesses and app developers become more competitive.[36] Moreover, small businesses and entrepreneurs in underserved regions of the country have the opportunity to redesign old business models that were designed in an era when contract employers were a rarity, and companies were enormous institutions in major metropolitan centers. But their success will be partially determined by the federal, state, and local governments' ability to revisit their complicated regulatory systems and a willingness to encourage innovation and entrepreneurship in this new tech economy.

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[35] http://farmindustrynews.com/precision-farming/take-sky-high-tech-field-scouting?page=3.
[36] Wilcox & Voskoglou, *supra* note 29 *at* 39.