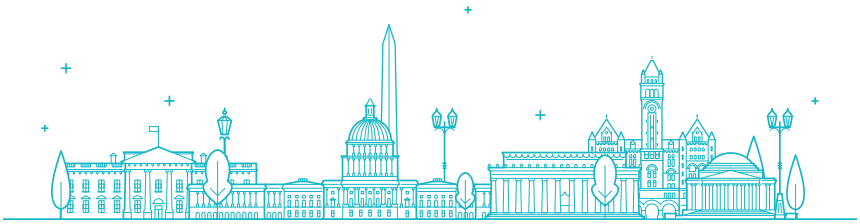
ACT
The App Association



State of the U.S. App Economy: 2020

By ACT | The App Association

7th Edition

Smartphones are the single most rapidly adopted technology in human history, outpacing innovations like the printing press and the steam engine. In just 10 years—and with the marriage of app stores (or platforms), mobile, and cloud—apps changed the phones, devices, and services we use every day. Altogether, platforms, devices, apps, developers who make apps, the consumers who use them, and all of the associated the economic activity (like digital transactions) make up the app economy.

The developer-platform model is succeeding, and we can expect competition to continue to drive innovation: In just the first half of 2020, the two major app stores generated $50.1 billion in revenue—a robust 23.4 percent increase over the first half of 2019's $40.6 billion. This growth suggests the developer-platform model is not only succeeding but outperforming the rest of the economy by orders of magnitude. Moreover, app economy growth is likely to endure because developers are continuing to create new products, services, and markets that did not exist prior to platforms.

But the network of activity driving this economy is more than just the apps on a phone. In the last 15 years, the sheer market power of the app economy resulted in a host of services to support and grow app development. Everything from digital advertising services to venture capital funds to tech incubators comprise the wider ecosystem that serves app and connected device companies. The app economy provides tremendous business potential for small, independent companies to engage with customers on a global scale and bring the transformative power of their products to industries like healthcare, agriculture, and transportation.

The app economy faced a number of challenges in the last year. In this unprecedented time, the global community is contending with a unique set of pressures to find balance and stillness in a turbulent environment and seeking new ways to communicate, work, and monitor our health and wellness. Many app developers could not face these new challenges without reexamining their business models and customers, and some pivoted to find new value for consumers and clients.

We believe 2020 presented a turning point for the app ecosystem for years to come with greater opportunity in healthcare, education, cloud services, and commerce. Our State of the App Economy report highlights the stories beyond the numbers and identifies trends and issues that will shape the ecosystem in 2021.

Morgan Reed

President

ACT | The App Association

About

ACT | The App Association

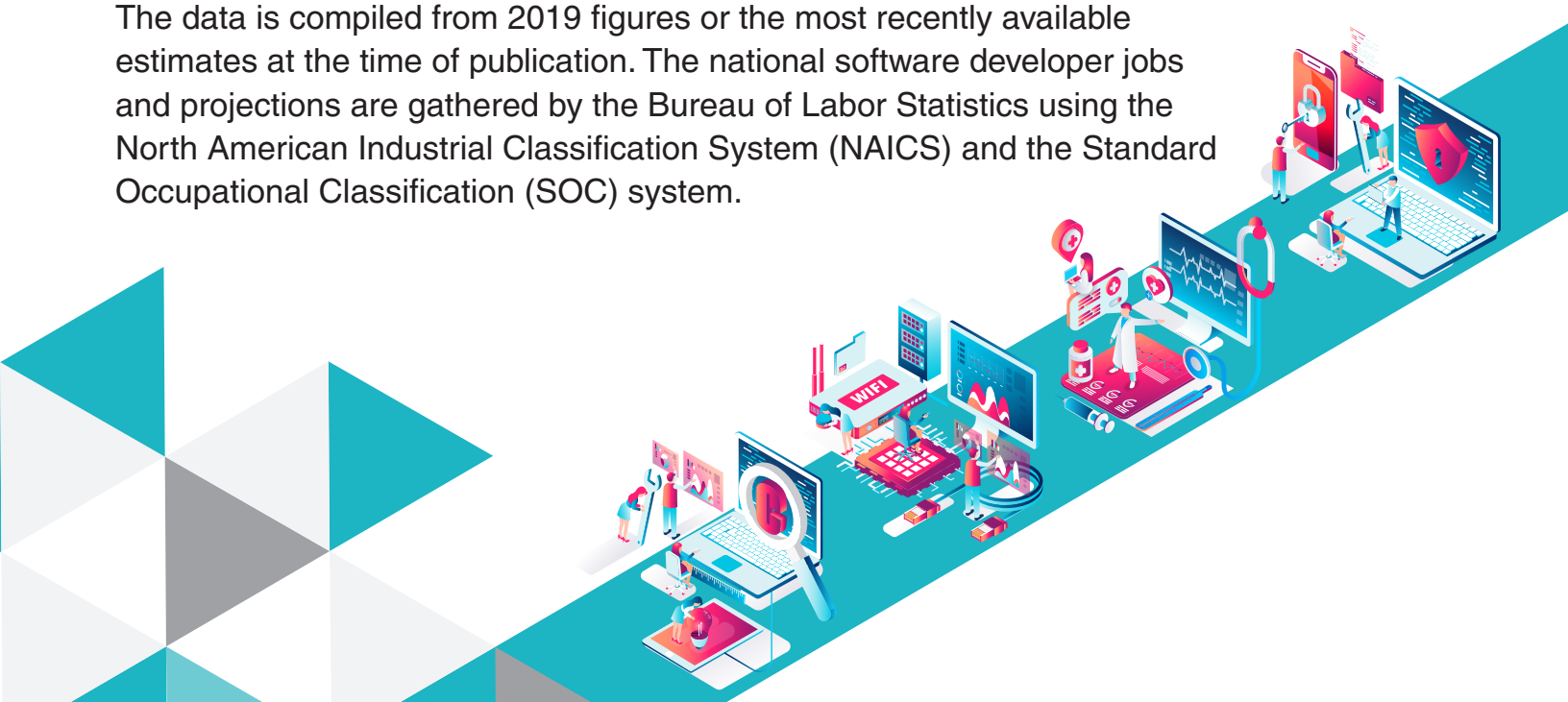
ACT | The App Association is an international organization for small and medium-sized tech companies. We work with industry leaders and new entrants that are innovating to improve productivity, accelerate learning, deliver entertainment, and promote healthier lifestyles. Together we represent the growing app ecosystem in all its diversity. The app marketplace is growing in areas outside traditional tech hubs. In the United States, more than 83 percent of app companies are located outside of Silicon Valley, and 13 percent operate in rural and suburban areas.

With a flourishing app economy in all 435 congressional districts across the United States and around the globe, app makers are as mobile and diverse as the industry they represent, working in any location and in companies as small as a single developer.

Report 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 industry publications, company statements, and government agencies including the U.S. Bureau of Labor Statistics, U.S. Census Bureau, the Federal Communications Commission, and the National Center for Education Statistics.

The data is compiled from 2019 figures or the most recently available estimates at the time of publication. The national software developer jobs and projections are gathered by the Bureau of Labor Statistics using the North American Industrial Classification System (NAICS) and the Standard Occupational Classification (SOC) system.



The App Economy

Fast Facts:

- App developers and related companies, directly and indirectly, employ 5.9 million Americans.
  - The average salary for app developers and related companies was $93,760
  - States with highest job growth across the app economy– Colorado, Georgia, Maryland, New York, North Carolina, Ohio, South Carolina, and Virginia

- Today, there are more than 2 million apps available on the major app platforms.
  - Biggest categories of growth included –Mobile gaming, fintech and finance, health and wellness, streaming entertainment

- 317,673 companies are active in the mobile app market in the United States.

- The app economy is a $1.7 trillion ecosystem led by U.S. companies.

- Consumers spent more than $120 billion globally in app stores, nearly two times what consumers spent in 2016.

Spotlight:

Workforce Development and Education

The 21st-century economy requires a workforce equipped with the critical thinking training that lays the groundwork for coding and information management skills. However, our education system is failing to keep pace with the growing demand for American workers with computer science backgrounds and qualifications.

Many companies in the app ecosystem report a persistent challenge to find American workers with computer science qualifications. This undermines their ability to compete on the global stage and hampers economic growth.

Fast Facts

- **Despite providing a median annual salary exceeding $93,000, more than 500,000 computing jobs remain unfilled in America.**
- **With just 71,000 U.S. college graduates earning computer science degrees in 2019, recent American graduates are filling a mere fraction of the available computing jobs.**
    - **Moreover, the number of computer and information technology occupations is projected to grow 11 percent from 2019 to 2029, much faster than the average for all occupations in the United States—with the number of software developing jobs expected to grow by 21 percent in the same period.**

New skills development for job seekers is also a critical piece of developing a workforce to fill these jobs. In recent years, classes in coding and information management and “no code” app development tools, such as Swift and HTML5, emerged as a driving force for people looking to augment their current occupation or switch careers.

The private sector can help, but policymakers must create an environment in which employers and educators can equip those in our current and future workforce with the skills needed to fill and succeed in these positions. Today, only 47 percent of all high school classrooms teach computer science skills, and these classes continue to lack girls and underrepresented minority students.

Trend to Watch:

Broadband and the Digital Divide

Considering the current global health crisis, more people are using the internet than ever before, making clear the relationship between broadband access and the app economy. During a time where all of us are working, learning, receiving healthcare, and entertaining ourselves at home, the internet is more integral to our everyday lives. Unfortunately, our current situation also highlights the digital divide that prevents many Americans from having access to broadband services in their home, making our "new normal" a daily challenge for many.

Unfortunately, according to even the most conservative estimates, more than 20 million Americans currently lack access to broadband connections, leaving them on the wrong side of the digital divide. A major reason for the lack of adequate internet connectivity is the high cost of infrastructure deployment. Television white spaces (TVWS) help broadband providers solve the deployment cost problem because projecting a broadband connection over the airwaves is less expensive than using infrastructure to extend the connection to the entire "last mile." In October 2020, the FCC voted to adopt rules that enable robust use of TVWS for broadband on a nationwide basis.

The deployment of 5G infrastructure will create 8.5 million jobs in the United States over the next five years and add more than $900 billion to U.S. gross domestic product. 5G can provide fixed wireless service—which would compete directly with the traditional means of home internet access most consumers use now.

Fast Facts

- **Broadband supports the 77 percent of Americans who own a smartphone, and more than 28.4 billion internet of things (IoT) devices depend on wireless internet connectivity.**
- **All providers launched 5G services by mid-2019, and by 2023, estimates indicate that about 50 percent of Americans could be connected to the 5G network.**
- **Independent tests are already showing gigabit download speeds for 5G-enabled smartphones, and as hardware, software, and spectrum resources continue to improve, those speeds should increase further.**

Spotlight:
Connected Health

The COVID-19 pandemic revealed the benefits and limitations of digital medicine in 2020. And even beyond our current public health emergency (PHE), digital medicine must play a more substantial role in healthcare as the current physician shortage of 30,000 increases to an estimated 90,000 by 2025. And by 2030, an estimated 70 million Americans will be over the age of 65, about 80 percent of whom will have at least one chronic condition. To meet Americans' evolving healthcare needs, it is critical to extend each physician's reach to a larger population using connected health technologies.

Prior to the PHE, connected health solutions like telehealth and remote patient monitoring (RPM) showed enormous promise but had a modest impact on the practice of healthcare in the United States. Along with the anecdotal evidence emerging from the pandemic, a well-established and growing evidence base demonstrates that digital health tools improve patient engagement and outcomes, while also enhancing accountability and reducing costs throughout the healthcare value chain.

Fast Facts

- **Nearly 40 percent of Americans have had virtual healthcare appointments of some sort since the beginning of the COVID-19 pandemic, and the experience has been overwhelmingly positive.**
- **Ninety percent of those who had a voice or video appointment with a healthcare provider reported that the visit helped them address their symptoms, concerns, or questions.**
- **Seventy percent of Americans want the law to be permanently amended to allow telehealth visits for all patients who want them.**

Spotlight:
Wearables

Wearables, from commercial fitness smart devices to RPM for chronic conditions, are increasingly part of keeping track of health and wellness. Americans, particularly those living with chronic conditions, must be able to monitor their health from home. According to the Centers for Disease Control and Prevention (CDC), 6 in ten American adults live with at least one chronic condition including heart disease and stroke, diabetes, and cancer. Moreover, these are the leading causes of death in the United States and put Americans at greater risk of serious complications from COVID-19.

Fast Facts

- **A United Healthcare wellness program where consumers had incentives to track their movement, exercise, and related metrics saved $222 per year per person in medical costs.**
- **Another study conducted by the New York Institute of Technology in 2018 concludes that the use of wearables significantly increases physical activity and improves body composition.**
- **There's also evidence that wearables can track early COVID-19 symptoms such as individual changes in resting heart rates (RHRs) as well as sleep and activity levels—and based on these findings, professional sports leagues are distributing wearables for athletes to closely monitor these metrics to catch COVID-19 infections as early as possible.**

As more connected health innovations enter the marketplace, patient outcomes and consumer wellness will continue to improve, but only if federal policies allow them to do so.

Trend to Watch:

Privacy, Security, and Encryption

While big businesses dominate the headlines, small businesses are both the key to a federal privacy framework and the leaders in developing privacy practices that work for consumers. Small to medium-sized companies in the app ecosystem handle millions of terabytes of data per day, putting them on the front lines of protecting and enabling responsible use of data.

App developers know that consumers have important questions for companies that use and share their data. What data is being used or shared? Who is sharing data and with whom? How are they sharing or using it? The answers to these questions affect how consumers engage with the products and services created by app developers.

In recent years, both the United States and European Union drafted data privacy laws or reexamined existing laws to address these consumer concerns. To that end, the App Association developed tools and guides to help small businesses in the app economy comply with—and consumers understand—the Children's Online Privacy Protection Act (COPPA), the Health Insurance Portability and Accountability Act (HIPAA), the EU's General Data Protection Regulation (GDPR), and the California Consumer Privacy Act (CCPA).

We do this for a simple reason: trust is paramount to the app economy's success.

Cybersecurity is another cornerstone of protecting personal data. However, the cybersecurity field has a serious talent gap: With more than 500,000 unfilled cybersecurity/computing jobs, there are not enough technically-trained professionals to meet the needs of the app ecosystem or the broader U.S. economy.

Trend to Watch:

Privacy, Security, and Encryption

Tech companies and our educational institutions work hard to train American students, entry-level workers, and mid-career professionals for the jobs of the future. As national security increasingly intertwines with defending from cyber attacks, the private sector and governments need to provide additional resources for these educational efforts to protect commercial operators and global safety.

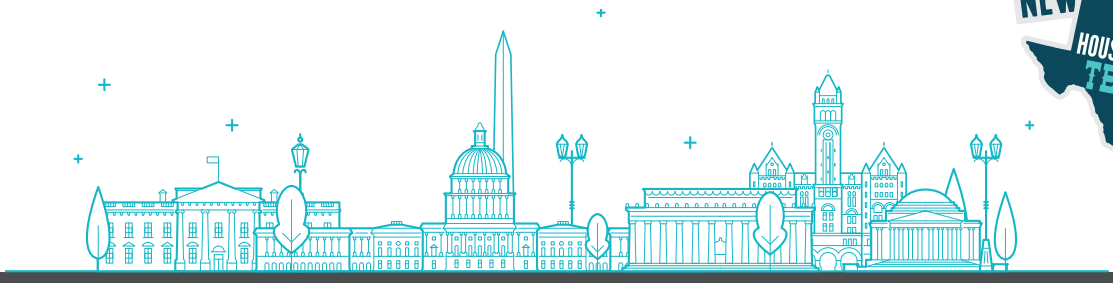
Encryption also protects the life and property of Americans: safeguarding Americans' digital transactions, from mobile banking to healthcare to retail purchases, depends on the ability to use strong technical protection mechanisms, including encryption. In 2019, identity thieves successfully targeted 14.4 million Americans resulting in 33 percent of consumers experiencing identity theft, which is more than twice the global average. As millions of Americans have moved to fully remote work during the pandemic, the exigency for strong data security policy only grows.

The App Association recognizes that the modern notice and consent model is not always a sufficient means of communicating privacy expectations or establishing a relationship of trust. Consent often fails to contemplate dynamic uses of data and does not encapsulate consumers' future expectations given the passage of time or changing contexts. We believe the time is now for our industry, regulators, and policymakers to have a frank discussion on privacy, security, and encryption centered on consumer experience while preserving the ability for small innovators to compete and develop better privacy practices and communication methods.

Spotlight:

Developed | The App Economy Tour

From September 2019 to February 2020, the App Association embarked on a 12-city tour of the United States, visiting cities with thriving app ecosystems and robust tech communities. The series of events, called Developed | The App Economy Tour, brought entrepreneurs, business leaders, industry experts, and local, state, and federal officials together for discussions on next-generation apps, game-changing mobile solutions, and innovations driving the app ecosystem. These events provided an opportunity for developers and entrepreneurs to get more insight into how to build a brand, what rules and regulations they must be mindful of, how to get into app stores quickly and efficiently, and how to figure out what comes next in terms of funding streams and business opportunities.



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Spotlight:

Developed | The App Economy Tour

Providence, Rhode Island
Thursday, September 12, 2019

First stop on Developed | The App Economy Tour: Providence, Rhode Island. Rhode Island may be a small state, but the tech community is mighty and has a profound impact on innovation that reaches far beyond the immediate area. The event on September 12th included a discussion featuring panelists representing the various components of the app ecosystem.

New York, New York
Thursday, September 19, 2019

Our second stop on Developed | The App Economy Tour took us to New York City. The five boroughs make up a thriving tech hub. Tech companies based in NYC span industries, sizes, solutions, and markets. New York City's startup community reflects the city's international nature. With a diverse workforce, company base, and sector-focus, the companies based in NYC have access to experts and insights unique to the city. The event on September 19th included a discussion featuring panelists representing the various components of the app ecosystem. They shared their thoughts on why NYC is a reat place to start and grow your company.

Spotlight:

Developed | The App Economy Tour

Boulder, Colorado
Tuesday, October 8, 2019

Our third stop on Developed | The App Economy Tour took us to Boulder, Colorado. While Colorado may not be a tech hub "on the coast," the tech sector throughout the state has a profound influence on innovation across the country. The event on October 8th focused on companies that chose Colorado as the place to grow their business and included a discussion featuring panelists representing the various components of the app ecosystem.

Atlanta, Georgia
Thursday, October 10, 2019

Our fourth stop on Developed | The App Economy Tour took us to Atlanta, Georgia. Atlanta is home to one of the most diverse entrepreneurship ecosystems in the country. Both in and just surrounding the city are a host of universities, technical institutes, and major corporations all supporting innovation and fostering a community that benefits entrepreneurship. When it comes to tech, Atlanta is also growing into a hub with a vibrant small business center already making important contributions to American ingenuity. The event on October 10th focused on companies that chose Atlanta as the place to grow their business, and included a discussion featuring panelists representing the various components of the app ecosystem.

Spotlight:

Developed | The App Economy Tour

Seattle, Washington Friday October 25, 2019

Our fifth stop on Developed | The App Economy Tour took us to Seattle, Washington. When it comes to tech, Seattle is well established as a home for innovation, but over the last 10 years the city became a hub for small businesses with a vibrant community that is already making astonishing contributions that span industries. The event on October 25th focused on companies that chose Seattle as the place to grow their business and included a discussion featuring panelists representing the various components of the app ecosystem.

Minneapolis, Minnesota Monday, November 25, 2019

Our sixth stop on Developed | The App Economy Tour took us to Minneapolis, Minnesota. Minneapolis is typically associated with big name brands like Target and 3M, but over the last 10 years, the city has become a hub for small businesses with a vibrant community that is already making astonishing contributions that span industries. The event on November 25th focused on companies that chose Minneapolis as their place to grow and included a discussion featuring panelists representing the various components of the app ecosystem.

Spotlight:

Developed | The App Economy Tour

Charleston, South Carolina
Tuesday, December 17, 2019

Our last Developed | The App Economy Tour event of 2019 brought us to Charleston, South Carolina. Companies in Charleston are often known for their government contracting work and dedication to cybersecurity, but over the last few years the city has become a hub for small companies that span industries while focusing on building a tech community in the south. During the event, our panelists discussed how to bridge the digital talent gap by empowering students and the changing workforce in the community and highlighted Charleston programs and entrepreneurial groups that attendees could turn to for business support.

New Orleans, Louisiana
Thursday, January 23, 2020

Our eighth stop on Developed | The App Economy Tour took us to New Orleans. Famously home to a thriving community of food, music, art, and history enthusiasts, New Orleans set its sights on tech in the aftermath of Katrina. As the city began to rebuild, the local government saw an opportunity to improve their infrastructure and make the city a friendly, resource-rich place for small companies to thrive. Since then, New Orleans has seen an influx of innovation, entrepreneurs, and startups, and the development of public and private resources and a diverse community dedicated to helping small businesses in the city succeed. The event on January 23rd included a discussion featuring panelists representing the various components of New Orleans's tech community who shared their thoughts on how companies can utilize the resources and community in New Orleans.

Spotlight:

Developed | The App Economy Tour

Santa Monica, California
Tuesday, February 4, 2020

Our ninth stop on Developed | The App Economy Tour took us to Santa Monica. Typically associated with Hollywood, the beach, and laid-back culture, Santa Monica is now home to a robust tech ecosystem drawing large companies like Snapchat and ICANN, while fostering an environment that supports and helps to sustain a thriving startup community. The area of Santa Monica known as Silicon Beach made it a point to build out infrastructure, resources, and communal spaces ideal for companies looking to build and grow along the surf. The event on February 4th included a discussion featuring panelists representing the various components of Santa Monica's tech ecosystem who shared their thoughts on how companies can utilize the resources and community in Silicon Beach to help jumpstart and/or grow their businesses.

Oakland, California
Thursday, February 6, 2020

Our tenth stop on Developed | The App Economy Tour took us to Oakland. While Oakland is Silicon Valley adjacent, many companies based in Oakland have chosen to build a robust and inclusive community with its own unique identity that fosters collaboration. The event on February 6th included a discussion featuring panelists representing the various components of Oakland's tech ecosystem who shared their thoughts on how companies can utilize the resources and community in Oakland to secure funding, understand privacy legislation, and help jumpstart and/or grow their businesses.

Spotlight:

Developed | The App Economy Tour

Houston, Texas
Thursday, February 13, 2020

Our penultimate stop on Developed | The App Economy Tour took us to Houston, Texas. The city, traditionally associated with oil, gas, and energy companies, recently experienced an influx of small companies innovating across sectors, and in response prioritized bringing in infrastructure to foster an environment that supports and helps to sustain a thriving startup community. The event on February 13th included a discussion featuring panelists representing the various components of Houston's tech ecosystem who shared their thoughts on how companies can utilize the resources and community in Houston to help jumpstart their businesses, market their companies more effectively, and treat data responsibly.

St. Louis, Missouri
Thursday, February 20, 2020

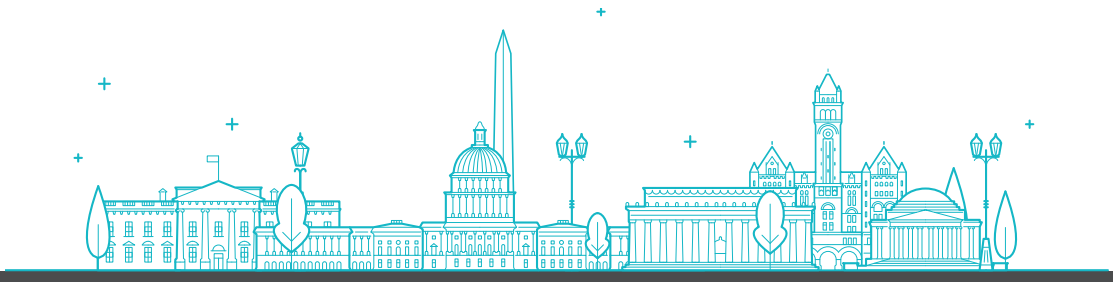
Our final stop on Developed | The App Economy Tour took us to St. Louis, Missouri. While Missouri may not be typically associated with a robust tech ecosystem, in the last decade St. Louis has built a mighty tech community that has a profound impact on innovation that reaches far beyond the immediate area. The event on February 20th included a discussion featuring panelists representing the various components of the app ecosystem who shared their thoughts on the resources for entrepreneurs in St. Louis and the uniquely supportive community; how to balance privacy and data necessity; and creative ways to think about funding and marketing.

The App Economy Workforce: State by State

State	Estimated App Economy Workforce
Alabama	47,720
Alaska	5,550
Arizona	106,710
Arkansas	25,671
California	720,010
Colorado	130,960
Connecticut	58,010
Delaware	16,900
District of Columbia	47,690
Florida	237,090
Georgia	169,840
Hawaii	11,880
Idaho	17,500
Illinois	205,360
Indiana	67,800
Iowa	41,930
Kansas	39,290
Kentucky	37,140
Louisiana	22,210
Maine	13,630
Maryland	145,330
Massachusetts	166,820
Michigan	122,150
Minnesota	108,260
Mississippi	14,190
Missouri	88,190
Montana	9,260
Nebraska	33,420
Nevada	23,910
New Hampshire	25,650
New Jersey	159,430
New Mexico	17,350
New York	301,030
North Carolina	158,000
North Dakota	7,720
Ohio	168,190
Oklahoma	35,580
Oregon	59,950

The App Economy Workforce: State by State

State	Estimated App Economy Workforce
Pennsylvania	177,060
Rhode Island	15,900
South Carolina	47,030
South Dakota	8,630
Tennessee	65,640
Texas	412,350
Utah	65,520
Vermont	7,510
Virginia	230,160
Washington	186,590
West Virginia	12,300
Wisconsin	84,390
Wyoming	3,370



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