

West Virginia and the Innovation Economy

A Quick Start Guide

"There is a global transformation underway. Innovative new business, economic and social models, coupled with access to rapidly advancing new technologies, are empowering people to transform our world. Positioning your company (state) to succeed in this transformational environment is not an option; it is an imperative. It is essential for succession and survival - and it is every leader's mandate to take part in that journey with intelligence, culture, and process."

*—Faisal Hogue, Author of Survive to Thrive: 27 Practices of
Entrepreneurs, Innovators and Leaders*



What is the Innovation Economy?

[The Innovation Economy](#), sometimes also referred to as the New Economy, capitalizes on workers' brains rather than their backs. It is talent and knowledge intensive rather than physical labor intensive. It requires continuing education in many forms, accessibility and adoption of technology, and a culture that encourages calculated risk-taking in business startups. [Innovation is central to economic growth](#) in today's knowledge-based economy. Rather than the capital, land, and labor required for entry into the traditional or Old Economy, talent and knowledge are key in the Innovation Economy, where wealth is created and accumulated via intellectual property: patents, copyrights, and inventions, much of which are intangible. For example, the innovation economy allows a kid from a working class family to come up with an idea, build a model in his family garage, and sell it to the world as the first Apple computer, or another kid to start up a social networking site in his college dorm room, and become a multi-billionaire with an idea called Facebook.

Knowledge workers in this economy are called "the creative class." They are designers, planners, makers, tinkerers—anyone who creates his or her job out of knowledge and skills, often technical, that they have developed. **Their jobs can't be easily mechanized.**

According to the [Information Technology and Innovation Foundation 2014 report](#), West Virginia is 49th among states on the Innovation Economy Index, followed by Mississippi, which comes in at 50.

Create West Virginia believes our people can be reoriented to apply their native intelligence and creativity toward taking better care of themselves and creating their own prosperity.



A Brief History of Innovation Economy Thinking in West Virginia

Create West Virginia began discussions about the needs and desires of the “creative class,” in 2006, when a group of business and professional people gathered informally to discuss early drafts of a white paper titled, [“Creativity, Culture and Innovation: West Virginia and the New Economy.”](#) written by Elizabeth Damewood Gauchier, who was then working for Terrill Ellis. The gathering was under the auspices of the Creative Class Working Group, a sub-committee of Vision Shared, a non-profit organized during the Republican Underwood administration in 2000.

The group that has become Create West Virginia began public activities in June 2007, with a press conference to introduce the white paper to the public. In November 2007, Create West Virginia hosted its first statewide conference, at Stonewall Resort. **“Creatives”** from every sector—science and technology, education, many types of businesses, and economic and community development professionals, attended. We learned that **entrepreneurs, scientists, and tech innovators** are **creatives** as much as **artists, architects, musicians, and writers**. We learned that **people who make their livings based on knowledge and talent** are part of the “creative class.” Because of modern technological advances, these “creatives” frequently can choose where they want to live and work in a way that wasn’t possible fifteen years ago. They choose places where they feel safe to be themselves, and where they find a stimulating lifestyle. “Place” is very important to this multigenerational, often mobile group of people. **People who innovate are creatives.**

Creatives of all kinds, from entrepreneurial software designers and scientists to artists, curriculum developers to furniture makers, mathematicians to architects and venture capitalists--all are members of the creative class. This socio-economic class was first described by American economist and social scientist [Richard Florida](#), now head of the Martin Prosperity Institute at the [Rotman School of Management](#) at the [University of Toronto](#). The Creative Class is a key driving force for economic development in a [post-industrial](#) United States.

Following are brief summary overviews and links to Internet articles and various sources of information about aspects of the Innovation Economy and its five pillars that make for resilient communities: Diversity, Education, Entrepreneurship, Quality of Place, and Technology.



The Role of Government in the Innovation Economy

What is the state's role in developing Innovation Economy opportunities? What policies, attitudes, and infrastructure is needed to attract and retain job creators in the New Economy? Who are the innovators we should be recruiting?

[Harvard Business Review: When Social Capital Stifles Innovation](#)

[World Economic Forum: What is government's role in sparking innovation?](#)

[Innovation Economy in Government Practices and Policy Development](#)

[The US Science, Technology, and Innovation Outlook - What can we learn from this data?](#)

[Who Are the Innovators?](#)

Important Trends in the World of Work

How we work, collectively speaking, is changing. People go to their clients instead of receiving them; many people don't have offices. They contract, co-work, and connect to deliver their work products from all over the world. They are mobile, agile, and interested in amenities places offer them. Employment policy is critically important.

<http://www.techolicy.com/modernizing-employment-policies-to-unleash-the-new-economy.html>



Diversity Leads to Economic Growth

Research suggests that places with high levels of diversity are better able to adapt new technologies and ideas. We invite others to read the studies that chart the role of geographic isolation, proximity and cultural diversity on economic development from pre-industrial times to the modern era.

“It's time for diversity's skeptics and naysayers to get over their hang-ups. The evidence is mounting that geographical openness and cultural diversity and tolerance are not by-products but key drivers of economic progress. Proximity, openness and diversity operate alongside technological innovation and human capital as the key engines of economic prosperity. Indeed, one might even go so far as to suggest that they provide the motive force of intellectual, technological, and artistic evolution.”

-Dr. Richard Florida



[CityLab](#)

[Cultural Diversity, Geographical Isolation, and the Origin of the Wealth of Nations](#)

Diversity in the Workplace Unlocks Innovation and Drives Market Growth

New research provides compelling evidence that diversity unlocks innovation and drives market growth—a finding that should intensify efforts to ensure that executive ranks both embody and embrace the power of differences.

This research, which rests on a nationally representative survey of 1,800 professionals, 40 case studies, and numerous focus groups and interviews, scrutinizes **two kinds of diversity: *inherent and acquired***. Inherent diversity involves traits you are born with, such as gender, ethnicity, and sexual orientation. Acquired diversity involves traits you gain from experience. For example, working in another country can help you appreciate cultural differences, and the challenge of selling to an exclusive base of men or women can give you gender smarts. Companies whose leaders exhibit at least three inherent and three acquired diversity traits have two-dimensional diversity.

[Harvard Business Review: How Diversity Can Drive Innovation](#)



Innovation in Education

The next wave of education innovation won't come from dumping technology in classrooms. Instead, it will come from deeply engaging with people and empowering them to make learning all their own.

At this link are two opposite views of how to improve education. Jodi Goldstein, who officially became head of [Harvard's i-lab startup incubation center](#) discusses the opportunities and challenges of bringing an entrepreneurial mentality into America's oldest university.

Mattan Griffl, founder of [One Month](#), a subscription-based online education startup, comes at the problem from the other direction, rethinking online education in the aftermath of the [MOOC \(Massive Online Open Course\)](#) explosion. "[Online education] has kind of overstepped its current effectiveness," he argues, "and everyone is saying what is possible by painting this picture, but the tools haven't reached that point yet."

[TechCrunch: Searching for the Next Wave of Innovation](#)



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Entrepreneurship, Innovation, and Leadership

In his 1942 book, Capitalism, Socialism and Democracy, economist Joseph Schumpeter introduced the notion of an innovation economy. He argued that evolving institutions, entrepreneurs, and technological changes are at the heart of economic growth. Even though this book was released in the '40s, it is only in recent years that "innovation economy," grounded in Schumpeter's ideas, has become a mainstream concept.

Since 2009, [Aspen Institute's](#) Economic Innovation roundtables validate that innovation, to be effective, requires a real leadership impact that stems from collaboration, vision, and above all, the will to direct progress for long-term growth. It is about how to harness any organization's full potential through leadership mandates and actions for a sustainable future.

[Fast Company: The Three Pillars of the Innovation Economy](#)



Quality of Place and its Impact on Economic Development

If people don't want to live and work in West Virginia, we can't have a strong economy. What attributes most drive community attachment? What does a place need to offer to new job creators? According to a [Gallup Poll commissioned by the Knight Foundation](#), three characteristics that matter most are social offerings, openness, and aesthetics. Others include **education, basic services, economy** and **services**. **Social offerings** are places for people to meet (also referred to as "third places") and the feeling that people care for each other. **Openness** is what the report referred to as **welcoming to all**. How open/welcoming is a community to different types of people? **Aesthetics** is physical beauty, beauty of the built environment including public and green spaces, quality architecture, historic preservation, sustainable universal design for all people with a wide range of needs.

The perception of any "place" is dependent on the perception and performance of the area's **education offerings**; the quality of **basic services** that offer **safe, reliable water; healthy, fresh food; healthcare** and **wellness/support services** for multiple generations; **affordable transportation; vibrant business districts, proximity** to affordable, quality goods and services like **recycling**; the health of **local food networks; quality building and safety standards** that include **sustainable, energy efficient** and **healthy building practices**. Certainly, these are not on the list of usual drivers of traditional economic growth,



and we're just getting started. Public health, medical innovation, access to research and technology hubs, trails, outdoor amenities, universally designed amenities, accessibility, affordability, the list of things that drives choices goes on.

For much of the 20th century, economic development and community development were largely separate. The resulting geography of innovation was dominated by isolated research parks. Today, cities are recognizing the reinforcing benefits of inventive people working in quality places that reflect local culture and history and fuel the constant exchange of ideas. Many of these cities are experiencing a rise of vibrant mixed-use districts created by people and companies who want proximity to networks of investors, entrepreneurs, researchers, and skilled workers.

The Brookings Institute has identified [innovation districts](#)— dense, amenity-rich enclaves that are typically anchored by Research & Development institutions and facilitate new ideas and businesses—as a new geography of innovation that joins economic development and **placemaking** for **quality growth**. [The Bass Initiative](#) will continue this research and extend its inquiry to additional types of emerging vibrant commercial and cultural districts. These entrepreneurial hubs are anchored by assets such as advanced research universities, medical campuses, historic warehouses, waterfronts, main streets, and public markets, and serve as destinations for their local communities.

[The Brookings Institute: Innovation and Placemaking](#)



Technology: Its Role in Development

The speed and level of technological innovation is mindboggling, and unstoppable. West Virginia could capitalize on tech-driven opportunities to innovate in every persistent problem area. Tech innovation is driving improvements in healthcare, communications, research, energy, building and design, manufacturing, home entertainment, education, politics and more. Technology can help us find better solutions to chronic problems. And no, tech innovation doesn't begin and end with elite, technically proficient people you'd never meet in your lifetime. Ideas, problems, gaps, needs... anyone who can identify an opportunity to address these can build a team and a plan to launch the next big thing. Or, they can settle for solving a problem in their business or local community.

At a time of immense economic volatility, West Virginia could be developing policies, infrastructure and investments that will attract and retain people who create new jobs, who solve problems. Nations



smaller than our state are creating technological infrastructures that directly impact their economies.

[World Economic Forum: Five Ways Technology Can Help the Economy](#)

Jobs of the Future... Robots may replace 50% of our current jobs by 2026

No job lasts forever. Not even a robot's job lasts forever. Experts predict a massive change in the world of work, one in which robots might put 50% of jobs at risk in the U.S. and the U.K. over the next 10 to 20 years. Knowing this now, at a time when West Virginians are asking what's next, could lead to some very interesting opportunities for the Mountain State, if we understand the opportunity.

People must acquire portable skills that support their talent; find work that workers in other countries can't do, and that robots are not likely to do. Read about [BotSourcing](#) to totally stretch your mind and catch you up, if only for a minute, on what's happening in the world of tech-driven innovation.

From [Jobs.com](#) Five Long-Lasting Technology Jobs/Careers

It's hard to come up with a reason *not* to pursue a technology career given the employment outlook for the sector. For one, IT-related jobs are some of the best-paying careers for new college graduates. In fact, on ThinkAdvisor's list of the [30 best-paying college majors and careers](#), those affiliated with the IT industry commanded 12 of the top spots.

The tech revolution of the past few decades has indelibly altered the business and cultural landscape. Today, we live in an "app economy" that revolves around the smartphone apps we now depend on for everything from mobile banking to fitness tracking. In fact, Time magazine estimates that these applications will contribute almost a [half a million jobs](#) to the U.S. economy.

The projected employment growth in the technology industry is much stronger than that of other industries. The [Bureau of Labor Statistics \(BLS\)](#) predicts employment in computer systems design and related services will grow by 3.9 percent, compared with the national industry average of 1.3 percent. Clearly, the tech industry is the place to be for job-seekers. Below, we've compiled a list of the five best careers in this burgeoning field.

Computer Software Engineer

This job typically involves developing and optimizing computer systems or computer applications software. [Computer software engineers](#) are the go-to professionals for mobile app design, but their training also equips them to create general computer software for business clients. According to the BLS, software developers specializing in applications had a mean annual wage of \$96,260 in 2013, and the number of these jobs available will grow by 22 percent in the next decade. The clamoring demand for mobile apps as well as an increasing number of mobile devices that run them will sustain growth in this profession.

Cloud Architects

Cloud computing is much more than a fleeting fad--it is the future of the nexus between business and [information technology](#). The promised efficiency and flexibility of private clouds has businesses



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frantically seeking qualified professionals who can create and manage these custom data centers. [Cloud architects](#) typically have a strong traditional IT background but also understand that the cloud is a dynamic entity, unlike conventional IT systems, which have defined parameters.

These professionals help design and maintain the cloud, but they also manage vendor relationships, negotiate licenses, and monitor technical results. Because this niche is fairly new, the BLS does not have exact salary information, but computer network architects in general made an average of \$97,700 in 2013.

Computer Systems Analyst

The IT careers with the most longevity are those that help integrate technology with business. Professionals like computer systems analysts who understand the needs of businesses as well as the logistics and capabilities of IT will always be in demand. Computer systems analysts evaluate organizations' existing computer procedures and systems and create IT solutions to maximize operational effectiveness and efficiency. These analysts stay apprised of technological trends and consult with management to identify emerging solutions that might improve the organization's performance.

The BLS predicts this occupation will see job growth of 25 percent in the next decade, which is much faster than 11-percent occupational average. In 2013, computer systems analysts made an average of \$85,320.

Data Scientist

An inescapable cliché in IT departments and boardrooms alike is "data is the new oil." Businesses are quickly catching on to what "big data" (the information produced by system logs, web clickstreams, transactions, social media, and other activity), can do for their bottom line, and they need help making sense of it all. Both the demand for and the potential of this career prompted the *Harvard Business Review* to call data scientist the "sexiest job of the 21st century." Obviously, big data is here to stay.

But what exactly do these sexy professionals do? An evolution of the traditional data or business analyst position, [data scientists](#) typically have a strong background in computer science and applications, statistics, math, modeling, and analytics. Their role is essentially to "tame" unwieldy and seemingly nonsensical big data so business can identify patterns that offer insights into customer behavior, system vulnerabilities, and security risks. A data scientist looks at data from all angles to spot trends that might provide solutions to an urgent business problem or give companies a competitive advantage.

The median salary for a data scientist with 0-3 years of experience is \$80,000, while those with nine or more years' experience make \$150,000 according to a Burtch Works' 2014 study. Job outlook for this career is also rosy--a 2011 [McKinsey Global Institute report](#) predicted that there will be 4 million big-data-related positions by 2018, along with a 1.5-million shortage of people to fill them.

Web Developer

Not all high-paying, long-lasting tech jobs require years of higher education. Case in point: web developers, who create and design websites, need only an associate's degree for most positions. These professionals are responsible for the aesthetic appearance of websites as well as their technical side, including capacity and performance. Web developers determine how much traffic a site can accommodate.

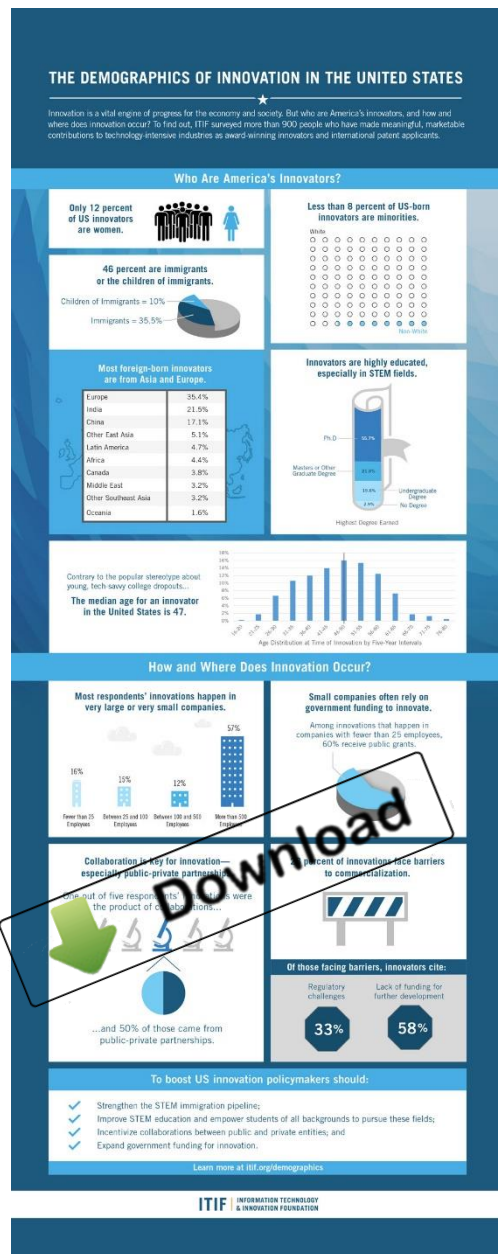
E-commerce has not shown any signs of slowing down, so the employment prospects for web developers are robust. Likewise, consumers increasingly view emails and websites on their smartphones instead of



PCs, which drives demand for web developers who can help businesses make their sites mobile-friendly. Employment in this profession will grow by 20 percent in the next decade according to the BLS, which is almost twice the national occupational average. In 2013, the BLS reported a median annual wage of \$67,540 for web developers.

Looking back over the past few decades, the tech industry has unrelentingly demonstrated growth and optimistic job outlooks. What's more, this industry shows more resilience for economic vicissitudes than other sectors, with the recent recession barely affecting its employment rates according to the BLS. For job-seekers looking for careers that are both on the rise and here to stay, technology positions can offer the best of both worlds.

Who Are the Innovators and How Do We Cultivate, Attract, and Retain Them?



Behind every technological innovation is an individual or a team of individuals responsible for the hard scientific or engineering work. And behind each of them is an education and a set of experiences that impart the requisite knowledge, expertise, and opportunity. These scientists and engineers drive technological progress by creating innovative new products and services that raise incomes and improve quality of life for everyone.

But who are these individuals? How old are they? Were they born in the United States or abroad? Are they male or female? What are their races and ethnicities? What kind of education do they have? Identifying the characteristics of the individuals who create successful, meaningful innovation in America can shed important light on how to broaden and deepen the country's pool of potential innovators through STEM education (science, technology, engineering and math), immigration, and overall innovation policies.

This study surveys people who are responsible for some of the most important innovations in America. These include people who have won national awards for their inventions, people who have filed for international, triadic patents for their innovative ideas in three technology areas (information technology, life sciences, and materials sciences), and innovators who have filed triadic patents for large advanced-technology companies. In total, 6,418 innovators were contacted for this report, and 923 provided viable responses. This diverse, yet focused sampling approach enables a broad, yet nuanced examination of individuals driving innovation in the United States.

[Read more at Information Technology & Innovation Foundation](#)



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