

Bay Area Community Council

Signals Team Report: Economic Transformation – August, 2020

BACC is the leading organization in engaging community leaders in understanding and shaping the future of the greater Green Bay area.

Vision and Method

Our method, **foresight analysis**, is the ability to anticipate and lead change. It has two broad focal points; **process:**

how plausible futures can be identified; and **content: what the plausible alternative futures may be.** As part of our effort to improve local processes, we aim to infuse **foresight analysis** tools into the strategic planning processes of organizations in the greater Green Bay area. We do this by helping them learn the techniques and tools and by providing support as they actually use them.

Organizations using foresight analysis first investigate trends, events and choices affecting key issues that will have the greatest impact here in the greater Green Bay area. They then systematically explore the implications of this issue content to create scenarios (plausible alternative futures) so they can begin to monitor and manage organizational change in the direction of desired futures.

Foresight Analysis: Investigation by Signal Teams

In support of the investigation phase of foresight, BACC has used the [2016 LIFE Study](#) and the 2018 [Envisioning the Future Report to the Community](#) as a base of information to identify issues of greatest concern. We have created Signal Teams around four key areas of concern: Economic Transformation, Health and Wellness, Pathways for Success and Community of Choice. These signal teams are collecting information about trends, events and choices that are currently developing. The teams will create reports and develop conversations in the community about their findings so that this content can be used by organizations conducting foresight analysis projects.

This Report: Economic Transformation

In addition to the LIFE Study and Envisioning the Future report, BACC has also accessed a number of other resources about our local economy: the [New North Business Intelligence project](#), [Journey to a Greater Green Bay](#) which is BACC's own economic development report, and the Greater Green Bay Chamber's [Economic Development Strategic Plan](#). Researchers on the Economic Transformation signals team have selected these issues likely to shape our future for more study:

- entrepreneurship and innovation,
- the role of women in the workplace,
- workforce availability, and
- the role of technological advances

This is their initial report on mid-term trends and events likely to have impact on greater Green Bay's economic transformation.

Because business practice in the near to mid-term future is expected to be unusually fluid due to COVID-19 response requirements, "We," as Harvard's Claire Messud says, "have the rare opportunity to confront who we actually are and to consider who we want to be."

Summary of Trends Identified

Entrepreneurship and innovation

- Green Bay has taken a large step forward during the past decade acting with a “build it and they will come” approach to establishing an entrepreneurial ecosystem that will allow us to thrive collaboratively with large centers of entrepreneurial capability.
- Our community’s leadership continues to act decisively and collaboratively, effectively executing a plan enabling the community to take control of its future economic destiny.
- Democratization is increasing, creating access for minority entrepreneurs; their participation continues to increase and will approach parity. Access to support talent, capital, incubators and accelerators is creating zero barriers for all entrepreneurs.
- US levels of entrepreneurship talent, self-perception and capability are rising in real terms; this confidence is replicated in Greater Green Bay as we support entrepreneurs at increasingly effective levels.
- Due to COVID-19, agile and fast moving entrepreneurs will have vast opportunities to develop products, services, and business models in areas that are not commanded by large invested leaders.
- Foresight Analysis is a structural tool that will promote greater agility and innovation for our local entrepreneurs.

Women in the workplace

- Studies show that companies with diverse, inclusive cultures gain an operating performance edge over their competitors. They show that women outscore men in taking initiative, practicing self-development, displaying high integrity and honesty, contributing to the growth of others, championing change, and communicating “powerfully and prolifically.”
- Progress of women in organizations is constrained by the “broken rung”: The first leadership step on the way to manager. Once on the leadership track, they progress well. Women need to promote themselves more forcefully as candidates for that first leadership position (lead, supervisor, etc.), and for the leadership development track.

Workforce availability

- Local workforce aging will increase. Over the next 20 years the percent of those over 55 increase, and every other age bracket decreases. U.S. Census projections indicate that by 2045 the U.S. will become minority white and Brown County is likely to mirror this trend.
- Minorities aren’t attending four-year colleges/universities at the same pace as white population. As a result they will fall behind in income development.
- Automation will greatly impact our area’s five highest employment sectors (Office Support, Production, Sales, Food Prep and Transportation) accounting for 55% of total jobs. This will have a disproportionate impact on those with lower levels of education.
- Changes in the employment structure will lead to a decline in jobs and wages for unskilled workers.

Technological advances

- Blockchain applications, initially created to provide a transaction system for Bitcoin, are most used for data security and transaction integration needs, and will develop slowly for a while.
- The advent of 5G will allow even more expansive development of complex Internet of Things systems and applications. Current applications include: The Apple Watch bringing internet applications/information to your wrist; unlocking the doors and turning on lights as your car approaches your house; smart devices in your kitchen. Lots of sensors sending information to controllers.

Trends Report: Entrepreneurship/Innovation & Start-up Ecosystems – Randall Lawton 8-1-20

Due to the meltdown in international trade relations juxtaposed with the Pandemic there is enormous disruption occurring that offers innovation opportunities for entrepreneurs as well as agile, aggressive, and fast moving businesses to develop novel approaches to serving customers and beating their competitors, even large national ones. Greater Green Bay's developing ecosystem has the capacity to help them succeed.

Trends Summary

- Green Bay has taken a large step forward during the past decade acting with a “build it and they will come” approach to establishing its ecosystem. The 21st century global competition for talent and knowledge is increasing. Mid-sized Legacy communities are challenged to respond by **establishing entrepreneurial ecosystems** that allow them to thrive collaboratively with large centers of entrepreneurial capability.
- When the components of entrepreneurial ecosystems are put in place and **executed effectively the economic dynamism of those communities grows**. There are many communities whose **leadership and management** are acting on this as well as supporting stronger growth in other key quality of life components. Our community's leadership continues to act decisively and collaboratively, enabling the community to take control of its future economic destiny.
- **Democratization** is increasing creating access for minority entrepreneurs and their participation continues to increase and will approach parity. Access to support talent, capital, incubators and accelerators is creating **zero barriers for all entrepreneurs**.
- **US levels of entrepreneurship talent, self-perception and capability** are rising in real terms during the past twenty years according to the organizations that have studied these numbers for a long time. This confidence is replicated in the Greater Green Bay community as we support entrepreneurs at increasingly effective levels.
- Covid-19 is moving our cheese and, while negatively impacting communities, **agile and fast moving entrepreneurs will have vast opportunities** to develop products, services, and business models in areas that are not commanded by large invested leaders.
- **Foresight Analysis** is a structural tool that will promote greater agility and innovation for our local entrepreneurs.

This paper will relate the national and global trends to our region and community, providing us focus and energy to leverage these trends to benefit economic growth and health of Greater Green Bay.

The Changing Landscape

Ten years ago Greater Green Bay was dealing with the Great Recession and its manufacturing base problems while progressive cities were creating innovation centers that took charge of their business development destiny. That appeared to be a preferred future for regions that supported high quality jobs, significant investment, and became a magnet for talent. Over the past decade global investors, entrepreneurs, businesses, and governments have awakened to the role of start-ups and entrepreneurial spirit utilizing technology to drive new and innovative products and services achieving startup business success and the creation of high quality jobs.

“One emerging approach in economic development strategy recognizes that regional economies vary rarely develop new specializations out of thin air. Rather, they diversify into those specializations off an existing and related base of knowledge embedded in industries or other institutions. Their likelihood of success in that area depends both on their own capabilities and how unique those capabilities are in the wider economic system. For instance, in the early 2000s, many U.S. regions concluded that they should seek to become the next center of biotechnology. Yet only a small handful—places such as Boston, Philadelphia, Raleigh-Durham, and San Diego—possessed the necessary ingredients to grow and nurture that industry, and offer a distinctive “niche” to companies, researchers, workers, and investors. These realities have given rise to new approaches in economic development that, particularly in Europe, exist under the banner of smart specialization. As Brookings scholars describe in two recent reports (one on Canada, and the other on U.S. regions), regional economic development officials can use complexity analysis to understand the types of innovations and industries that are feasible and valuable targets for diversification from their base of research and industry assets.”¹

“Instead of one new center or two new centers (of entrepreneurship, besides Silicon Valley), there will be 30, and there will be clusters in different places that don’t quite get to the density of the Bay Area but get beyond critical mass.” Sam Altman, Y Combinator and Open AI

“But, small places with limited market, financial, and talent reach will lose a substantial percentage of their start-ups to these larger centers. That is acceptable as long as the programs and initiatives are focused on supporting local competitiveness.” Omar Sultan, Sultan Ventures²

The 21st century global competition for talent and knowledge will only continue to increase. This pace will appear frightening until a community engages with the competitive challenge. Any community that is behind must seek to develop entrepreneurial ecosystems that will support creating businesses of the future. Competition will increase while niche opportunities will flourish for those communities that understand, focus, invest, and act. Major opportunity for communities that get the message and collaborate.

Analysis has yielded several specific resources communities can put in place to support the increase in quantity of startups and likelihood of success. These are modeled in the definition of **entrepreneurial ecosystems: the formal and informal infrastructures that need to be in place for entrepreneurship and**

¹ Berube, Alan. *Small and Midsized Legacy Communities: Trends, Assets, and Principles for Action*. Brookings: Metropolitan Policy Institute, Washington, D.C. 2019. https://www.brookings.edu/wp-content/uploads/2019/11/201911_BrookingsMetro_Legacy-communities_Berube_Final.pdf

² Fuji-Oride, Noelle. “How to Get Startup Paradise to the Next Level,” *Hawaii Business Magazine*, May 11, 2020. <https://www.hawaiibusiness.com/startup-paradise-next-level/>

innovation to thrive. These structures include incubators, accelerators, mentoring programs, and importantly access to peer input through networks and office space availability, and access to capital in multiple rounds, corporate venture capital, and peer-to-peer investment.

Our Community's Strategy

Build it and they will come

This is our opportunity. Our community leadership has chosen to act, to build, to create a more robust, dynamic, competitive economic community that has the benefits of sustainability in the 21st century. We do, in fact, understand what is required. The Greater Green Bay Chamber recently did a strategic plan that had a robust entrepreneurial and innovation ecosystem as one of its key initiatives and NEW North is currently working on NEW Launch Alliance as one of four regions supported by WEDC focused on the regional ecosystem including a Start in NEW North directory on SourceLink platform. This is intended to be a real time asset map data base for broad use covering networks and capital sources. This serious attention and action steps by economic development leaders have already created forward momentum and the next decade will continue to yield gains

Deeper competencies in what you are good at. Titledown Tech's concentration on five targeted clusters already present in our community shows it is maintaining excellent focus. Its drawing power is beginning to attract entrepreneurs, mentors, and investors that are capable of making impact. The rest of the ecosystem components are aligning themselves as they understand their relative positions and applying their resources toward optimizing needed capabilities, thus creating critical mass for the entire system. Greater Green Bay leaders are grasping their roles. Commitment, actions, and support are becoming increasingly available. The big difference: broad based leadership is listening and thinking, recognizing they have a role.

"Too many communities concentrate on attracting businesses from afar instead of growing them at home. In a thriving ecosystem, entrepreneurship empowers individuals, improves standards of living, and creates jobs, wealth, and innovation in the economy. But the success of an entrepreneurial ecosystem can't be bought; it has to be built...together, we can grow inclusive and empowering economies and explore the best ways to support the makers, the doers, and the dreamers." Kauffman Foundation 2019 State of Entrepreneurship Address-Wendy Guillies CEO

"Finally, the most successful startups operate in a **well-connected, well-funded ecosystem**. Supporting our startups is not solely the responsibility of our government and economic development organizations; it is up to all of us to get engaged. Big companies, investors, family offices, non-profits, retirees and foundations all have a role to play in seeding and growing the local companies of the future." Cameron Cushman Director of Innovative Ecosystems at Univ. of Texas-Fort Worth

Executing the strategy

"June 4, 2020—Madison, Milwaukee, Green Bay and Appleton made significant gains in a leading startup ecosystem ranking of 100 countries and 1,000 cities, registering "amazing momentum," according to the report's authors.

StartupBlink is a global startup ecosystem map and research center that works with dozens of governments, municipalities and economic development corporations on the development, mapping and benchmarking of their startup ecosystems, and support networks for entrepreneurs.

Madison rose 26 spots in StartupBlink's 2020 Global Rankings Report to 98th globally, while Milwaukee jumped 31 spots to 132nd. Green Bay's ranking of 446th was up 44 places, while Appleton came in at 581st, an improvement of 35 spots."³

"Titletown Tech. Rise of the Rest 2019 Ecosystem Playbook/Model 1: Anchor Tenant identified Titletown Tech as our community's de facto innovation ecosystem leader, its Anchor Tenant. It is functioning as both the model (providing a higher level of expertise and acceptance for components of the ecosystem) and as the "anchor tenant" attracting talented organizations into the Greater Green Bay ecosystem space."⁴

Formed out of a partnership between the Green Bay Packers and Microsoft, Titletown Tech builds, enables and invests in early-stage and existing businesses. The organization identifies solutions, develops startups, and funds entrepreneurs across five key targeted "verticals" (clusters of related companies): sports, media and entertainment; digital health; agriculture, water & environment; advanced manufacturing; and supply chain technology. Through a three-part structure, Titletown Tech enables innovation, exploration, and disruption to address industry challenges. The Innovation Lab identifies and explores digital, transformative solutions. The Venture Studio develops creative market solutions with new and existing startups. The Venture Fund invests in high-growth scalable ventures that leverage the region's strengths. Titletown Tech will continue to grow in importance and will collaborate broadly as its capabilities grow in scope and scale.

STEM education and research capabilities. NEW risks brain drain without local development of technical talent, and it is now happening. Most highly successful development regions have significant universities with graduate schools and research facilities. Because entrepreneurship and innovation are driven by application of knowledge from discoveries this is only going to become more important to regional success. The STEM Center and College of Engineering at UW-Green Bay was fought for and established in full recognition of this requirement while other local colleges and collaborative relationships will make serious contributions. NWTC and St. Norbert and other regional colleges have a role in expanded STEM education that yields innovative products and services. Titletown Tech's recently formed relationship with WARF (Wisconsin Alumni Research Foundation), the University of Wisconsin-Madison's non-profit technology transfer organization, will provide access to the incredibly strong research being done at UW-Madison. This is a large leap forward for UW System technology sharing outside of Madison and a statement about the power of TitleTown as a magnet for creating businesses that apply technology. The fact that this relationship was established as rapidly as it was and UW-Green Bay's College of Engineering and STEM

³ Wisconsin Economic Development Corporation. "Wisconsin metros rise in global startup ecosystem ranking," *Urban Milwaukee*, June 4, 2020. <https://urbanmilwaukee.com/pressrelease/wisconsin-metros-rise-in-global-startup-ecosystem-ranking/>

⁴ *Place Matters: Ten Innovative Real Estate Developments Driving Startup Hub Growth*. 2019. https://www.revolution.com/wp-content/uploads/2019/09/ROTR2019EcosystemPlaybook.pdf?mc_cid=65f814f9d6&mc_eid=9de9368d4d

programs are growing rapidly demonstrates that there is now a real and growing technology and R&D capability available in the greater Green Bay area.

Government's role must be more than just cheerleader. As local businesses are constrained by lack of infrastructure, support, and funding, governments at all levels will recognize and benchmark their role in helping to lead and fund the creation of strong ecosystems. They will step forward because the success of these startups is the first stage in creating a spectrum of quality jobs and a successful local business climate. There is significant room for growth.

“Among the twelve conditions assessed among experts in entrepreneurship, finance, education, government and other areas, the United States rates lower than average of the 30 advanced economies only on government policies and programs. This is indicative of the modest role the US government plays in the thriving entrepreneurial culture.”⁵

Strong networks. “For a long time, the only people sharing stories about their successful businesses were shady hucksters looking to sell their own get rich quick schemes. But new entrepreneur communities are springing up left and right. Members of these communities openly share their business strategies and growth tactics. Even revenue numbers!”⁶

Among the components of entrepreneurial ecosystems—incubators, accelerators, mentoring programs, access to capital (multiple rounds, corporate venture capital, peer-to-peer investment)—one of the most important is access to peer input through networks and office co-working space availability.⁷

You get what you measure: Outside organizations such as StartupBlink and Kauffman clearly have big data collection capability that can measure and define where Greater Green Bay is positioned. A local dashboard of key results would properly focus attention on progress and needs.

Entrepreneurship - Equal Opportunity and Diversity

Clearly, since 2007 the entrepreneurs in our society are becoming more diverse and this trend will continue as opportunities and support are both more democratic and focused on helping minorities. The path of an entrepreneur is not an easy one. There is a tremendous amount of work, perseverance, personal and financial risk, learning and education, and motivation required to succeed. The ecosystem must be structured to seek equal opportunity participants and deliver support to all.

Minorities. “Minority startup rates have been substantially faster than Caucasian rates in the past five years and this differential should remain trending toward comparable entrepreneurial ownership and employment levels. When viewed in terms of rates...African/African Americans start businesses at a higher rate than (Caucasian & Hispanic) groups, exhibiting increasing levels over the past three years. In 2018, this

⁵ Global Entrepreneurship Monitor. “Entrepreneurial Behaviour and Attitudes: United States,” 2019. <https://www.gemconsortium.org/economy-profiles/united-states-2>

⁶ Howarth, Josh. “Top 7 Entrepreneurship Trends You Need To Know (2021),” December 8, 2020. <https://explodingtopics.com/blog/entrepreneurship-trends>

⁷ Hathaway, Ian. “What Startup Accelerators Really Do,” Harvard Business Review, March 1, 2016. <https://hbr.org/2016/03/what-startup-accelerators-really-do>. And Bone, Jonathan and Haley, Christopher. “impact of business accelerators and incubators,” nesta, October 17, 2019. <https://www.nesta.org.uk/blog/new-study-assesses-impact-business-accelerators-and-incubators/>

ethnic group reports nearly twice the TEA (Total Entrepreneurial Activity) rate as the White/Caucasian population.”⁸

“When compared to 2007, rates of entrepreneurship have increased dramatically among Latinos (up by 24.6 percent) and African Americans (up by 37.8 percent). The rate of new entrepreneurs among whites has remained steady (with a slight increase of 0.5 percent since 2007), and it has declined slightly among Asians (-3.9 percent). The share of new entrepreneurs who are from minority groups is now 45 percent, a considerable increase since 2007 when 33.6 percent of new businesses were started by non-whites.”⁹

Women. Women continue to improve their positioning in the US economy as entrepreneurs. While parity is slow in coming on many fronts it is very apparent in the roles they occupy in the ecosystem. The equality of opportunity in a sector that recognizes talent and rewards success will support growth of women’s rate of entrepreneurship.

“A closer look at entrepreneurial activity by stage (early stage, nascent, new businesses and established) shows a similar pattern in terms of closing the gender gap with some progress especially in early and nascent businesses. Specifically, in 2015 the TEA for early stage women entrepreneurs was 9.2%, compared with 14.6% for men, but by 2018 women had narrowed the gap to 4.1%, at 13.6% for women versus 17.7% for men. A similar pattern exists for nascent entrepreneurs where the gap narrowed from 3.4% to 2.9% and for new businesses as well, a gap of 2.1% to 1.2%. The only category reflecting less progress is established businesses where the percent of men in established businesses increased from 8.9% in 2017 to 10.4% in 2018 and declined from 6.6% to 5.4% for women.”¹⁰

Immigrants. Immigrants start businesses at almost twice the rate of US citizens, and while there is a significant amount of necessity driven (no other options) at about 20% but most are opportunity driven. There are many reasons for this difference but most is explained by the entrepreneurial culture here.

“In the United States, immigrants tend to be unusually entrepreneurial: available data suggest immigrants are over-represented within the group of business founders and innovators. The rates of immigrant ownership vary greatly by sector, with highest rates found in engineering and technology. Immigrant entrepreneurs greatly contribute to economic growth and innovation in the U.S., as documented by a number of empirical studies.”¹¹

⁸ Global Entrepreneurship Monitor. “Entrepreneurial Behaviour and Attitudes: United States,” 2019.

<https://www.gemconsortium.org/economy-profiles/united-states-2>

⁹ Kauffman Indicators of Entrepreneurship. *2017 National Report on Early Stage Entrepreneurship*. 2019.

<https://indicators.kauffman.org/wp-content/uploads/sites/2/2019/02/2017-National-Report-on-Early-Stage-Entrepreneurship-February-20191.pdf>

¹⁰ Global Entrepreneurship Monitor. “Entrepreneurial Behaviour and Attitudes: United States,” 2019.

<https://www.gemconsortium.org/economy-profiles/united-states-2>

¹¹ Ewing Marion Kauffman Foundation. *Kauffman Compilation: Research on Immigration and Entrepreneurship*. 2016.

https://www.kauffman.org/wp-content/uploads/2019/12/kauffman_compilation_immigration_entrepreneurship.pdf

Zero Barriers. “The entrepreneurs, policymakers, and others in the entrepreneurial community will pursue policies, practices, and regulations that eliminate imposed artificial barriers allowing a free market of ideas and inventions to flourish.”¹²

Microbusiness. “Start-up support will play a role as a take-off area for a more robust entrepreneurial culture helping provide minorities the resources for startup projects.”¹³

Kauffman Indicators of Entrepreneurship 2019 (data 1996-2019)

- “Overall trends in levels of entrepreneurship are perhaps best described by Kauffman’s Early Stage Entrepreneurship Index (KESE Index) that includes a) rate of new entrepreneurs b) opportunity share of new entrepreneurs c) Startup early job creation d) Startup early survival rate and it hit its highest level in over 20 years in 2015-17.
- “Opportunity Entrepreneurs” versus “Necessity Entrepreneurs” are increasing their rate
- Minority entrepreneurs are increasing their rate versus whites’ rate
- Immigrants rate is double native born Americans
- Younger Americans rate is decreasing while older 55-64 Americans are expanding their opportunity entrepreneurship rate significantly
- Veteran participation is decreasing significantly
- Job creation per startup is decreasing
- Survival rates have been steady for decades at 79-80%”¹⁴

Entrepreneurial ecosystems. Increasingly, diverse and inclusive entrepreneurial ecosystems will offer mentor networks, broad based incubator opportunities, accelerators that have critical mass of support talent and capital to impact effective innovation’s probability of success, and capital availability. The strongest, most inclusive networks that guide and support entrepreneurs will achieve the most success. Potential for startup support will be virtually everywhere and available to virtually everyone.¹⁵

US Entrepreneurial Strength

The US is positioned to remain the leading entrepreneurship nation during the next decade. While global competitors are working hard to catch up not many of them have the competencies, capabilities, and scale to supplant our leadership, while their competition energizes US companies.

Due to the strength of US entrepreneurial culture and social norms, as well as finance and the past decade of strong growth in entrepreneurial ecosystems throughout much of the US, we can expect continual

¹² Kauffman Entrepreneurs. “Zero Barriers.” <https://www.entrepreneurship.org/external-link/zero-barriers-join>

¹³ Wisconsin Economic Development Corporation. “Application deadline extended to May 26 for Ethnic Minority Emergency Grants,” May 22, 2020. <https://urbanmilwaukee.com/pressrelease/application-deadline-extended-to-may-26-for-ethnic-minority-emergency-grants/>

¹⁴ Kauffman Indicators of Entrepreneurship. 2017 National Report on Early Stage Entrepreneurship. 2019. <https://indicators.kauffman.org/wp-content/uploads/sites/2/2019/02/2017-National-Report-on-Early-Stage-Entrepreneurship-February-20191.pdf>

¹⁵ Coleman, Alison. “Generation Startup: The Future of Entrepreneurship,” *The Frontline*. December 19, 2019. <https://medium.com/the-frontline/generation-start-up-the-future-of-entrepreneurship-7f1cbf812f43>. And Cornick, Kate. “Startups at the heart of economic growth,” *Government News*, June 10, 2020. https://www.governmentnews.com.au/type_contributors/startups-at-the-heart-of-economic-growth/.

growth. Economies build on their strengths and do not change their cultures easily. Recent US growth in ecosystem development delivers a foundation for strong organic growth.

Entrepreneurial ecosystems are all proving to be successful when designed, structured, and executed effectively. They produce higher business survival rates, increased growth in employee numbers, higher amounts of investments raised and in corporate intrapreneurship higher levels of competitiveness. The increase of these capabilities has been very significant since 2009, and investment will continue until diminishing returns are reached.

“The United States stands out among the high-income economies in having people who both see entrepreneurial opportunities and perceive that they have the capabilities to pursue them. Seventy percent of Americans believe there are many opportunities around them for starting businesses, a level only topped by Sweden and Saudi Arabia. In addition, 56% of Americans believe they have the skills to start a business, equal to that of Canada, and exceeded only by Saudi Arabia, Chile and Uruguay. “

“.....the high level of opportunity perceptions was achieved through steady growth in most of the past decade, after a period of generally no growth or declines in this indicator. In 2018, over twice as many people believe there were good opportunities for starting a business than had held this belief in 2001. Capabilities perceptions, on the other hand, has shown remarkable stability.... This suggests that, despite what people think about what is going on around them, they maintain the same level of confidence about their entrepreneurial abilities.”

“The United States stands out in particular for its high levels of cultural and social norms embracing entrepreneurship, and for the quality and availability of entrepreneurial finance. For both of these conditions, the United States has higher ratings than any of the other high income economies, and for that matter higher than for any of the 49 economies in the 2018 GEM sample. One may point to these factors in explaining why the United States is considered such an entrepreneurial economy.”¹⁶

Innovation

When will investment in entrepreneurial ecosystems reach a point of diminishing return? This point will be impacted by education, risk management for entrepreneurs, duration of financial support, stagnation of innovative ideas, etc., but there is no apparent way human knowledge expansion will slow down. Even projections that no large scale inventions rendering the kind of impact on human societies that electricity, lights and air conditioning, automobile and air transportation, chemicals, medicines, etc. had in relatively short timeframe will stop human incentive to apply knowledge to create products and services that add value to people’s lives. Is a free society’s capacity to innovate limited? Our history demonstrates no, so expect continued innovation and business model invention.¹⁷

¹⁶ Global Entrepreneurship Monitor. “Entrepreneurial Behaviour and Attitudes: United States,” 2019. <https://www.gemconsortium.org/economy-profiles/united-states-2>

¹⁷ Coleman, Alison. “Generation Startup: The Future of Entrepreneurship,” The Frontline. December 19, 2019. <https://medium.com/the-frontline/generation-start-up-the-future-of-entrepreneurship-7f1cbf812f43>

Innovation Opportunities post Covid-19. Given all of the changes and disruption occurring as a result of Covid-19 there will be enormous opportunities in most economic sectors and companies are not yet strategizing to take advantage of them. This gap between current focus and capability offers the entrepreneurial ecosystem a unique opportunity to create and fill these needs without the same level of reactive competition that would exist in more normal economic times. There will be waves of disruptive technology applications created over the next decade as these industries re-stabilize, change their business models, and evolve.

Foresight Analysis growing role in entrepreneurship and innovation. The practice of foresight analysis will give best in class connections and access to experts—those who really know. World-wide, countries, regions, and companies are investing and collaborating to achieve breakthrough technologies and capabilities that shift markets and tilt competitive fields. Such disruption is frequently both relatively hidden and far enough in the future that they do not show up in organizations' standard strategic planning exercises. Organizations must do deep dives and understand where their competitive position is both tomorrow and in the future in order to ensure that their talent and capabilities and investments are positioning them for success. They cannot allow unknown-knowns to diminish their options. A best practice model for helping organizations deal with this critical need is Strategic Foresight Analysis. It adds a disciplined process and methodology that helps organizations of all kinds optimize their opportunities and minimize their risks.

Trends report: Women in the Workplace – Nan Nelson 8-2-20

Success for diverse companies

A November 2019 McKinsey [report](#) said “For pioneering organizations, inclusiveness is fundamental to enhancing gender parity and overall diversity, and results in financial and organizational performance. Overall, employees with a low perception of inclusiveness in their organization state that they have already given up on career opportunities due to their environment—and this is particularly true for women.”

Diverse and inclusive cultures are providing companies with a competitive edge over their peers. So concluded The [Wall Street Journal’s research analysts](#) in October 2019 in their first ranking of corporate sectors, as well as the individual companies in the S&P 500 index, based on how diverse and inclusive they are. Turns out the 20 most diverse companies in the research not only have better operating results on average than the lowest-scoring firms, but their shares generally outperform those of the least-diverse firms, the research shows. Many of the high-scoring companies in the study say that having a well-rounded workforce has helped them create better products and be more innovative, leading to growth in sales and profit. Analysts agree that diversity can help fuel innovation, which is critical to success in a fast-changing world where technological disruption has become the norm.

In September 2019 NPR reported that in an experiment, researchers found that investors were more likely to bet that a company's stock price would increase if it had more women on staff than average. That suggests investors see value in gender diversity and that companies that hire more women could see their stock prices rise. Those are among the findings of [a new study](#) by Stanford University, Northwestern University, Dartmouth College and the Hong Kong University of Science and Technology.

Changing world due to COVID-19

"It will be the boss/employee relationship, the CEO/company relationship that will change. Any CEO or leader that thinks they're getting back the same employee they had before this started will get a rude awakening. People now understand what's really important and it may no longer be tolerated to work 60 to 70 hours a week anymore." *Christina DiGiacomo, New York, quoted in Wall St. Journal, The Future of Everything, May 1, 2020. Women leaders may be better equipped to innovate and navigate this changing workplace because....*

Women on corporate boards

According to a Green Bay Press-Gazette report updated on February 17, 2020, the nonprofit Milwaukee Women Inc. has tracked the percentage of women appointed to public company boards for 15 years. Last year, it [reported that](#) about one in five board members in Wisconsin’s top 50 public companies were women, up from 18% in 2018.

According to a [report](#) by the organization [2020 Women on Boards](#), 18.5% of board seats were held by women in companies publicly traded on the Nasdaq composite in 2019. The percentage was slightly higher — over 22% — for companies traded on the New York Stock Exchange. This same report found 52% of companies in the [Russell 3000 Index](#) — a stock market index of 3,000 U.S. companies — had at least a fifth of their board seats held by women. Of these companies, 41% had one or no women on their boards.

[Research published by the Harvard Business Review](#) suggests women perform better than men in most leadership skills. As measured by employee reviews, women outscored men at taking initiative, practicing self-development, having a drive for results, displaying high integrity and honesty, contributing to the growth of others, as well as championing change and communicating "powerfully and prolifically." [HBR also found](#) that when women are on boards, male CEOs are less over-confident, thus improving overall decision-making.

"The research on this is very clear, the presence of women on corporate boards can lead to better and more complex decision-making that results in higher financial performance for companies," Jennica Webster, co-director at the [Institute for Women's Leadership at Marquette University](#), said. "Moreover, (having) women on corporate boards is related to better ethical compliance and increased corporate social and environmental responsibility."

A [study by Boston Consulting Group](#) found companies that reported above-average diversity on their management teams also reported 19% more revenue from new products or services than companies with below-average leadership diversity.

"When you look at the common traits and work styles of women versus men, women bring many times enhanced communication skills," [Lindsay Hammerer](#), a partner at the global auditing and tax firm KPMG said. "They tend to bring empathy to their work. They tend to take a little bit less risk — probably take more measured risk — than men do. They tend to work less with their egos." Studies show that companies with three or more female directors outperform those with fewer or no women, Hammerer said. Fifteen out of Wisconsin's top 50 publicly traded companies (30%) had three or more female directors on their boards in 2019. It was 25% in 2018. "To create a diverse board, "you need to have the courage, and the process, and the pipeline, to consider people who are not known to you."

Women in the workplace

[McKinsey's Women in the Workplace report](#), issued October 2019 was conducted in partnership with LeanIn.Org. Data and insights gathered since 2015 from close to 600 companies that participated in the study, and more than a quarter of a million people that were surveyed on their workplace experiences, and more than 100 in-depth one-on-one interviews that were conducted. Over the past five years, we have seen signs of progress in the representation of women in corporate America. Since 2015, the number of women

in senior leadership has grown. This is particularly true in the C-suite (CEOs, CFOs, etc.), where the representation of women has increased from 17 percent to 21 percent. Today, 44 percent of companies have three or more women in their C-suite, up from 29 percent of companies in 2015. Progress at the top is constrained by a "broken rung." The biggest obstacle women face on the path to senior leadership is at the first step up to manager. For every 100 men promoted and hired to manager, only 72 women are promoted and hired. This broken rung results in more women getting stuck at the entry level, and fewer women becoming managers. Not surprisingly, men end up holding 62 percent of manager-level positions, while women hold just 38 percent. The case for fixing the broken rung is powerful. If women are promoted



and hired to first-level manager at the same rates as men, we will add one million more women to management in corporate America over the next five years.

Five steps companies can take to fix their broken rung—and ultimately their pipeline 1. Set a goal for getting more women into first-level management. 2. Require diverse slates for hiring and promotions. When two or more women are included on a slate, the likelihood that a woman will get the position rises dramatically. 3. Put evaluators through unconscious bias training In companies with smaller gender disparities in representation, half of employees received unconscious bias training in the past year, compared to only a quarter of employees in companies that aren't making progress closing these gaps. 4. Establish clear evaluation criteria before the review process begins. Without exception, candidates for the same role should be evaluated using the same criteria. In addition, outside research shows that it can help to have a third party in the room when evaluators discuss candidates to highlight potential bias and encourage objectivity. 5. Put more women in line for the step up to manager. The building blocks to make this happen are not new—leadership training, sponsorship, high-profile assignments—but many companies need to provide them with a renewed sense of urgency.

Women in Science

In September 2019 the BBC reported that women make up half of students in the life sciences, but only one in four professors, according to data from 500 scientific institutions worldwide. The main problem lies with retaining and promoting women into influential positions, the study concluded. It found women had fewer chances to serve on committees or speak at scientific meetings. Other factors included unconscious bias, tensions with work-life balance, poor funding and pay, and a lack of networking opportunities. The data, published in the journal [Cell Stem Cell](#), came from 541 universities and research institutions in 38 countries in the US, Europe and Australia. Women made up more than half of undergraduate and postgraduate students, 42% of assistant professors and 23% of full professors, although rates varied by institution. The findings back the view of many women in science that more must be done to address the problem of the "leaky pipeline" - where women leave the profession due to problems such as harassment and issues around promotion and pay.

In an October 2019 Smithsonian [article](#) about Margaret Rossiter, the background is revealed. Her study, [Women Scientists in America](#), which reflected more than a decade of toil in the archives and thousands of miles of dogged travel, broke new ground and brought hundreds of buried and forgotten contributions to light. The subtitle—Struggles and Strategies to 1940—announced its deeper project: an investigation into the systematic way that the field of science deterred women, and a chronicling of the ingenious methods that enterprising women nonetheless found to pursue the knowledge of nature. She would go on to document the stunted, slow, but intrepid progress of women in science in two subsequent volumes, following the field into the 21st century. "It is important to note early that women's historically subordinate 'place,' in science (and thus their invisibility to even experienced historians of science) was not a coincidence and was not due to any lack of merit on their part," Rossiter wrote at the outset in the first volume. "It was due to the camouflage intentionally placed over their presence in science."

Local Impact of women in the workplace

How are we progressing? The presence of women on corporate boards and in the C Suites of local companies is not known. To make progress on this issue, it should be measured, and companies using best

practice should be located so their methods can be shared. [Susan Finco](#), [Leonard & Finco Public Relations](#), is a resource listed in the Press-Gazette article on this topic. Others who may be interested include: [O'Connor Connective](#), promoting itself as The Connective: A Place for Women in Business; [Women's Fund](#) of the Greater Green Bay Community Foundation; [New North](#) regional economic development coalition; the [Strategic Research Institute](#) of the Schneider School of Business at St. Norbert College; and the [economic development arm](#) of the Greater Green Bay Chamber.

Finco now serves on a number of boards, including the Green Bay Packers board of directors. She and C. Patricia LaViolette became the second and third women to join the board in 2000, though it can include up to 45 people (it currently has 42; Rosemary Hinkfuss was the first). Finco said that at that time, there was an earnest effort to include more women on the Packers board. She's since become the first woman on the Packers' seven-member executive committee, which leads the board. Finco acknowledges her background of public and community relations might not be the first thing people think of when they consider board-appropriate expertise. Usually, that's legal or financial. But business leaders are learning to value other skills like marketing, public relations and data analytics, Finco said. "I'm fortunate I'm on boards that are fairly well diversified," she said. "Although, I have to admit, every board I sit on right now is talking about diversity and the need for more diversity on boards."

Finco has advised women who are interested in serving on boards to choose a cause that matters to them and start with nonprofit boards to build up the skill set to serve on more boards. She has also advised women to network. That can be difficult for women, she said, who have many responsibilities besides their careers. But networking can be as simple as grabbing a coffee with someone.

Trends report: Workforce Availability

Dave Wegge

Introduction

You see it nearly every day, organizations not being able to find workers with the right skill-set to meet the organization's needs. As you drive the streets in Green Bay you see signs in front of company facilities pleading "Now Hiring." What will the workforce of the future look like in the greater Green Bay area? How will it be different than it is today? How do organizations traverse the technology shift taking place?

A recent McKinsey & Company article provides a succinct overview of some of these issues. Automation and the future of the workforce faces several key issues and challenges that exist as automation begins to take hold in organizations: 1) how will the demand for workforce skills changes? 2) How will organizations adapt to these changes? And 3) what strategies can organizations use to adapt to this changing workforce landscape?¹⁸

Executive Summary

This report focuses on three broad themes and trends that will impact the workforce in the greater Green Bay area in the next 10 years.

The aging of the population in the greater Green Bay area will have significant workforce effects.

The aging of the population will have a significant impact on the availability of people in the workforce as well as the demands for a workforce to serve the needs of an aging population. As views and needs of "retirement" evolve the increasing number of individuals over the age of 55 may also create new opportunities to meet our workforce needs.

Increases in the racial/ethnic diversity of our local population signaled by significant growth in diversity in public school enrollments will present challenges and opportunities for our local workforce. The future workforce in the greater Green Bay area will be much more diverse than the workforce of today. Workers in the next ten years will need to have higher levels of education and training. While many seniors in local high schools indicate they plan to attend college, it is lowest among the minority population segments that will experience significant increases the next few years.

Three of the highest employment sectors in the Bay Area may be the most impacted by automation. Individuals with lower levels of education will be disproportionately impacted by automation. Projected employment growth sectors draw attention to increasing inequities and different skillsets that will be needed in the greater Green Bay area workforce.

¹⁸ Bughin, Jacques et al. "Skill shift: Automation and the future of the workforce," McKinsey & Company. May 23, 2018. <https://www.mckinsey.com/featured-insights/future-of-work/skill-shift-automation-and-the-future-of-the-workforce#>

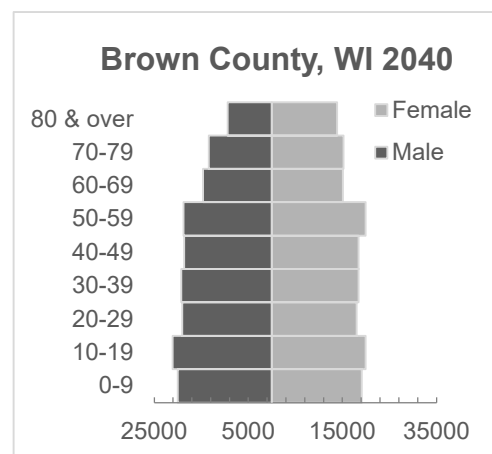
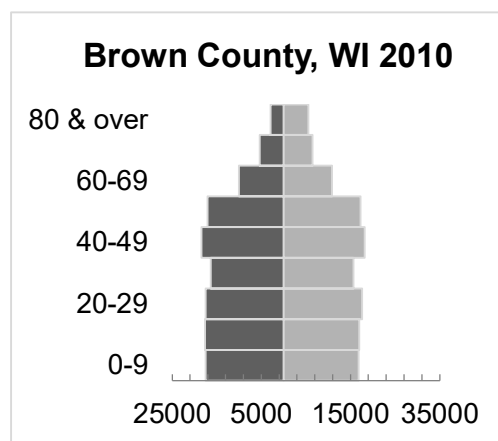
Key Question: Is the greater Green Bay area prepared to meet the challenges these trends present?

The Details

What trends will impact the future of the workforce in the greater Green Bay area?

#1: Population in the greater Green Bay area is aging and will have a significant impact on our workforce over the next 20 years.

- Brown County's population in 2040 is projected to be 312,000, a gain of more than 64,000 people, or 25%, since 2010.
- From 2010 to 2040: Breaking down the population into three broad age groups, the projected percent of the population in each group across the 30 year time period is as follows:
 - Ages 0-19: 27.8% in 2010 down to 25.7% of the population in 2040
 - Ages 20-34: 20.7% in 2010 down to 18.0% of the population in 2040
 - Ages 35-54: 28.5% in 2010 down to 24.5% of the population in 2040
 - Ages 55 & over: 23.0% in 2010 up to 31.8% of the population in 2040
- The age pyramids for Brown County are shifting from a pyramid shape to a cylindrical shape as the population becomes more elderly.



- Research by the UW Applied Population Lab states the following, "In sum, Wisconsin's population is growing older. While the baby-boom generation continues to age in place, their children, although now in prime childbearing years, are having fewer children or delaying childbirth. Meanwhile, the current age structure and birth rates of people of color are likely to account for a relatively larger proportion of future births." This article point to two major demographic and interrelated trends that will impact the future workforce in Wisconsin.¹⁹
- "The primary long-term challenge facing Wisconsin's economic future is its workforce quantity. The demographic situation facing the state, other upper Midwest states, and most western state economies will advance unaltered in the coming decades. The number of retiring baby boomers

¹⁹ Kemp, Sarah. "Why More Wisconsin Schools are Enrolling Fewer Students: Aging Communities, Fewer Births are Shaping the Future of Districts around the State," Wiscontext. September 9, 2019. <https://www.wiscontext.org/why-more-wisconsin-schools-are-enrolling-fewer-students>.

nearly matches the influx of new workers, resulting in a slow growing workforce that is constraining employers' abilities across industries to secure talent. Many businesses report the lack of available workers have hindered expansion and, in some cases, even curtailed their ability to meet current product orders.”²⁰

- An increasing number of individuals in the upper age groups may in fact be part of a solution to the workforce needs of our community. A new book by Robert Morrison and Ken Dychtwald, *What Retirees Want*, finds that many retirees continue to work in their retirement years. This increase in retirees continuing their work-life is driven by four factors: 1) Longevity, the simple fact that the average life expectancy has increased to the point that individual may continue to live 20-30 years after their retirement; 2) Changes in the pension which have moved from defined benefits to individuals having more responsibility for funding their retirement through defined contributions; 3) Economic uncertainty especially following the 2007-09 recession and the COVID pandemic. And 3) the revisioning of one's later life that focuses on a new purpose, stimulation, social interaction and fulfillment. The authors argue that organizations need to make adjustments in their thinking in order to become employers of choice for working retirees. Interestingly, in an earlier work in the *Harvard Business Review* (2004) the authors wrote an article entitled “It's Time to Retire Retirement.”

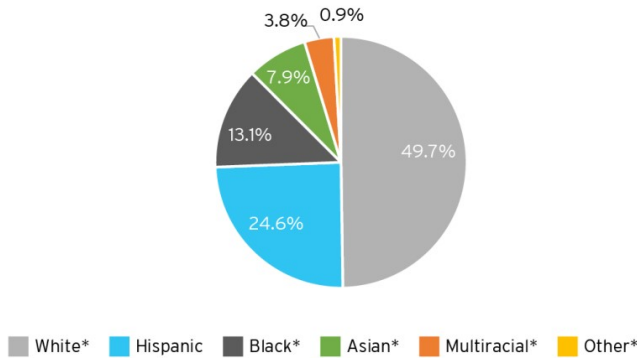
#2: Greater Green Bay area will continue to experience increased racial/ethnic diversity

²⁰ Long, Ryan. “2019 Workforce Profile: Brown County.” State of Wisconsin Department of Workforce Development. https://jobcenterofwisconsin.com/wisconomy/wits_info/downloads/CP/brown_profile.pdf.

- Nationally: U.S. Census projections indicate that by 2045 the U.S. will become minority white.

FIGURE 1

Racial profile of U.S. population, 2045



Source: William H Frey analysis of U.S. Census population projections released March 13, 2018 and revised September 6, 2018

B Metropolitan Policy Program
at BROOKINGS

“...census projections indicate that, for youth under 18—the post-millennial population—minorities will outnumber whites in 2020.”²¹

- Hispanics make up 6.9% of the Wisconsin population and 8.8% of the population in Brown County. But this will change significantly over the next decade.²²
- “When it comes to racial/ethnic differences within Wisconsin's public schools, the number of non-Hispanic white, non-Hispanic black and American Indian students have declined over the past 13 years, while the number of Asian and Hispanic students have increased.”
- Statewide public school enrollment for racial/ethnic groups changed significantly from 2007-08 school year to the 2018-19 school year: Hispanic school population increased 69.4%, Asian +12.9%, all other groups witnessed decreases in enrollments, White - 10.8%, African American -15.4% and Native American -25.1%. These numbers are public school only and do not take into account private schools, home schooling, etc.²³

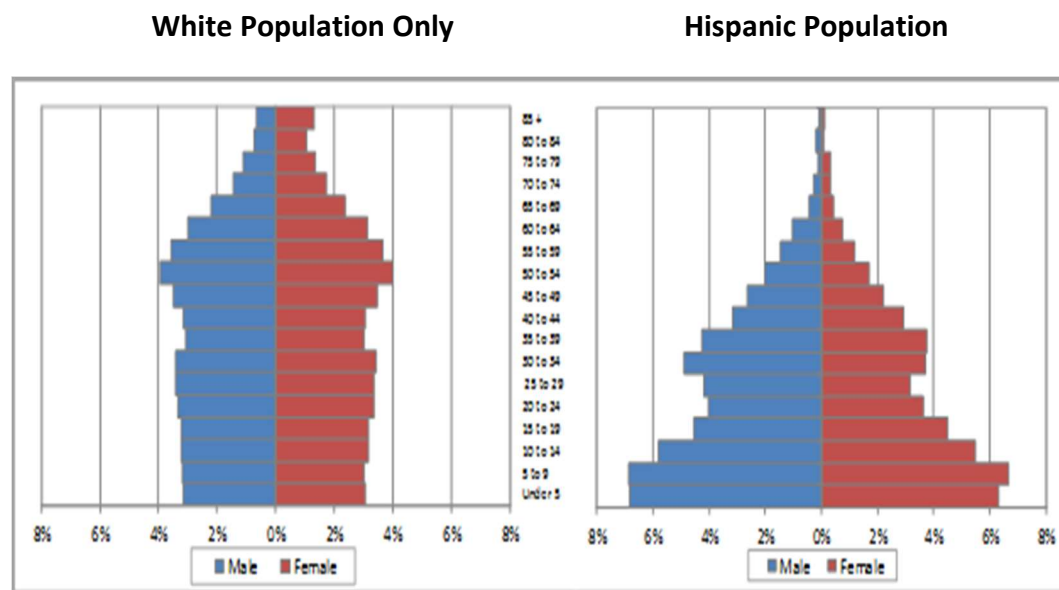
²¹ Frey, William. “The US will become ‘minority white’ in 2045, Census projects,” *Brookings*, March 14, 2018. <https://www.brookings.edu/blog/the-avenue/2018/03/14/the-us-will-become-minority-white-in-2045-census-projects/>.

²² County Health Rankings and Roadmaps. <https://www.countyhealthrankings.org/app/wisconsin/2020/measure/factors/56/datasource>

²³ Kemp, Sarah. “Why More Wisconsin Schools are Enrolling Fewer Students: Aging Communities, Fewer Births are Shaping the Future of Districts around the State,” *Wiscontext*. September 9, 2019. <https://www.wiscontext.org/why-more-wisconsin-schools-are-enrolling-fewer-students>.

Racial/Ethnic Population in Brown County

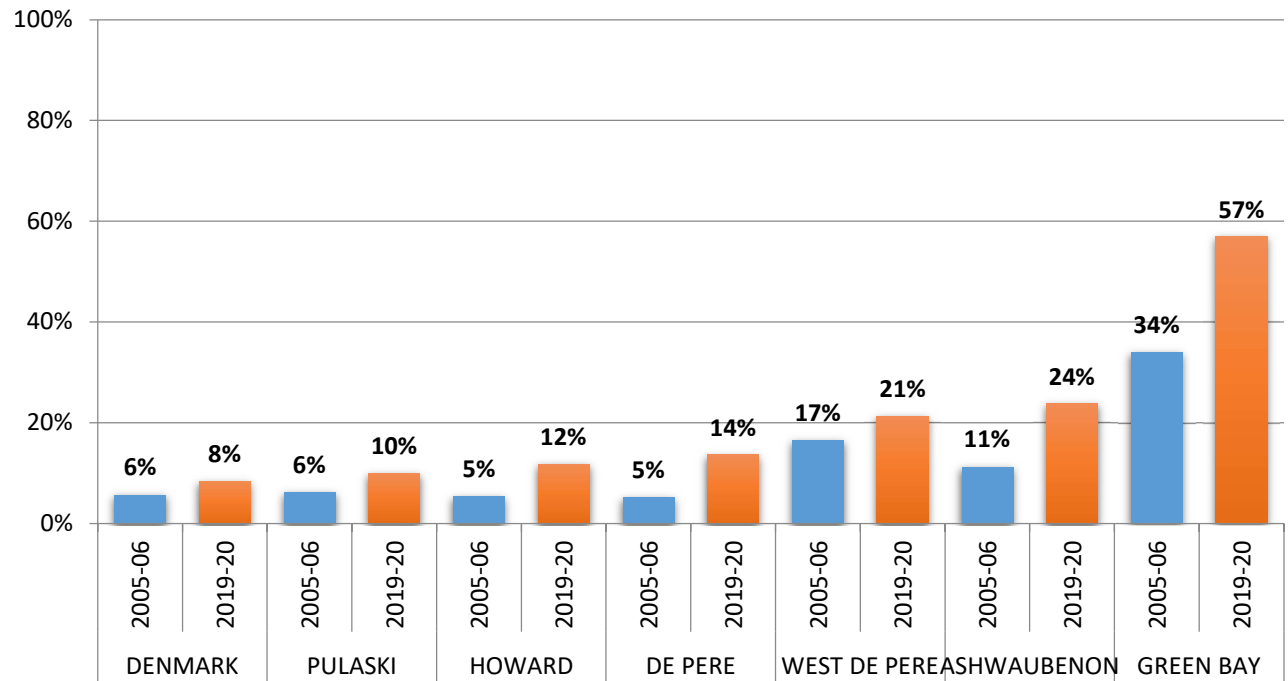
- Population pyramids of the white population and the Hispanic population in Brown County 2013 paint very striking differences of the age structure of these two population groups. While the white population pyramid is taking on the cylindrical shape the Hispanic pyramid is shaped more like the traditional pyramid existed in the white population in earlier times. These pyramids also suggest that it may be fruitful to look at the enrollment patterns in public schools in Brown County.



#3: The future workforce in greater Green Bay will be much more diverse than today.

- While the current population estimates of the minority population in Brown County is about 9% the percent of minority students in our public schools systems suggests that this percentage will increase significantly in the future. In the 2019-20 school year, for all of the public school district students in Brown County, 36.1% were minority students and 63.9% were white students. These overall numbers are driven primarily by higher minority enrollments in the Green Bay Area School District in which 57% of the students are minority and 43% are white.

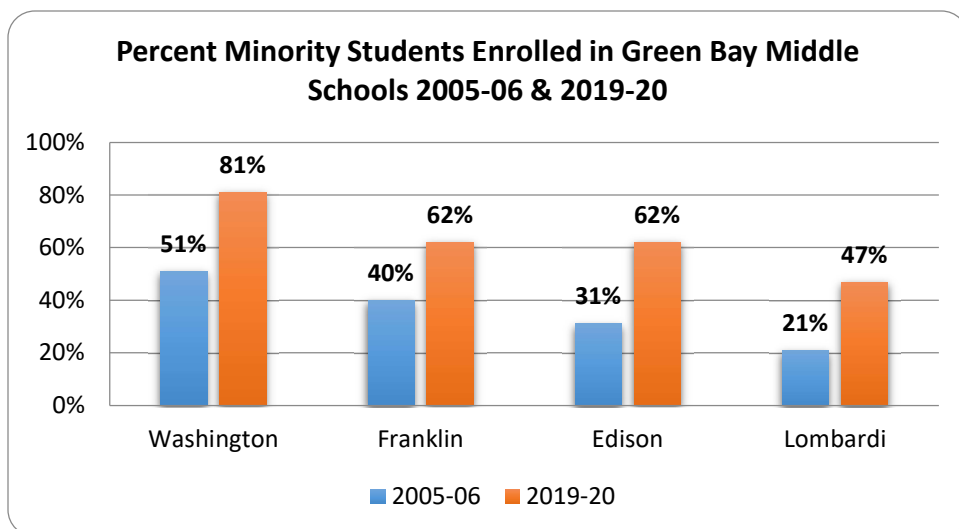
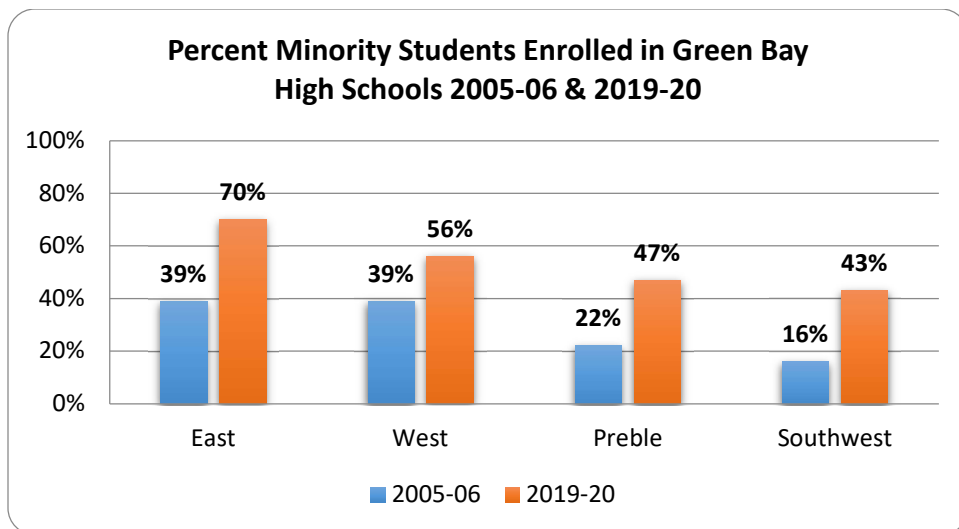
**PERCENT MINORITY STUDENTS IN
BROWN COUNTY PUBLIC SCHOOL DISTRICTS
2005-06 TO 2019-20.**



Percent Increase in Minority Students By School District 2005-06 to 2019-20

Green Bay	+23%
Ashwaubenon	+13%
De Pere	+ 9%
Howard-Suamico	+ 7%
West De Pere	+ 4%
Pulaski	+ 4%
Denmark	+ 2%

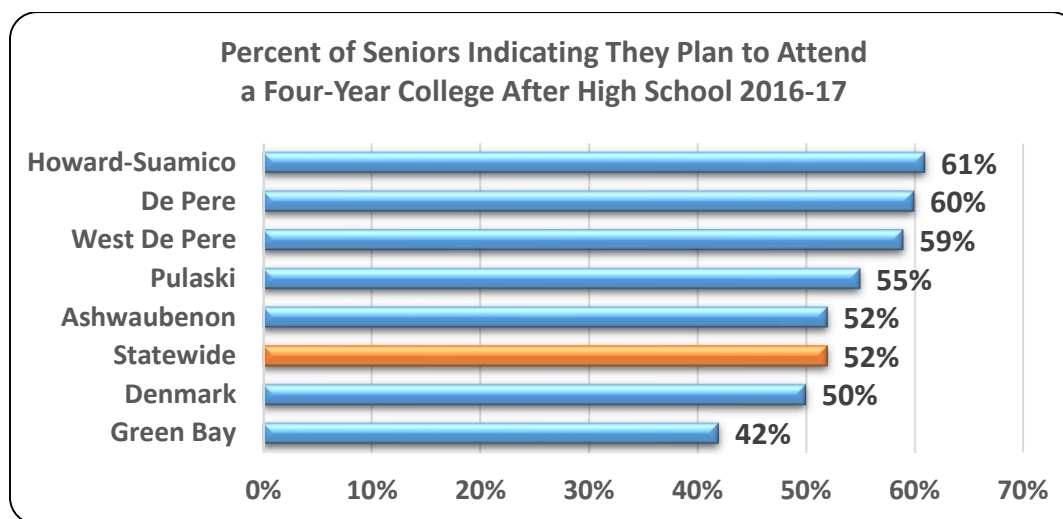
- From 2005-06 to the 2019-20 school years there has been a substantial increase in the number of minority students enrolled in the Green Bay Area School District schools.



- Middle schools are the feeder schools into the high schools. For the most part, Washington Middle School students tend to attend East High school, Franklin students go to West High, Edison to Preble and Lombardi to Southwest. Since the percent minority students in the feeder middle schools is higher than the percent in their paired high school, we would expect a higher percentage of minority students in each of the high schools over the next few years. The most significant increase may be in seen at Preble.

#4: The propensity for students in the greater Green Bay area to enroll in a four-year college is higher than the state average in the suburban school districts. It is lowest in the Green Bay school district. Intentions to pursue four-year college is particularly low among the minority population segments that will experience significant growth in the next few years.

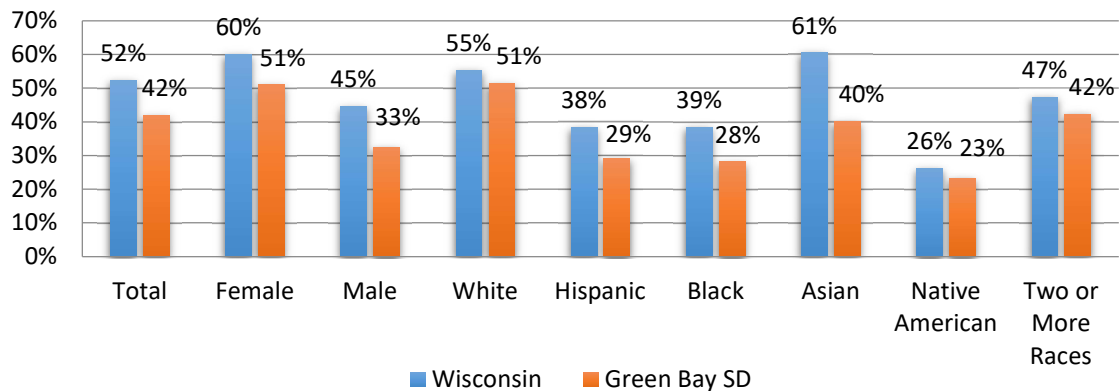
- The graph below presents the post high school graduation plans for all students in the greater Green Bay area school districts compared with all students in Wisconsin public schools.



#5 In the Green Bay school district the percentage of students indicating they intend to pursue four-year college enrollment is particularly low among the minority population segments that will experience significant growth in the next few years.

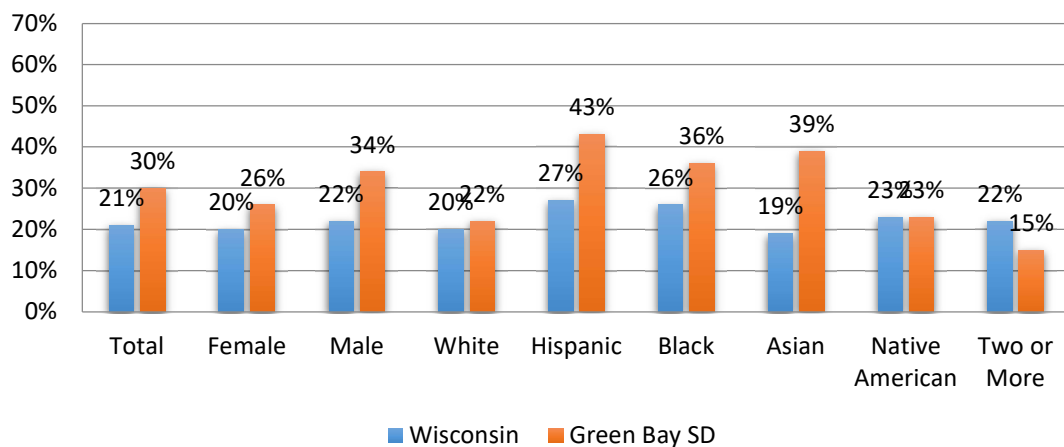
- The Green Bay School district has sufficient data to break down post high school intentions by race/ethnicity. There is a substantial gap between the statewide percentages and those in the Green Bay school district for nearly all demographic groups in the graph. There is also a substantial difference between male and female students. Males are much less likely to say that plan to attend a four-year college than female students. This is also a trend that exists nationally. What is quite striking is that the percentage in the Green Bay school district are also substantially below the overall state averages. The data is aggregated data, not individual level data, so it is not possible to break out gender differences for each racial/ethnic group.

Percent Green Bay School District Seniors in 2016-17 Indicating Their Post High School Graduation Plans are to Attend a 4 Year College



- In every category, students in the Green Bay Area School District are less likely to say they plan to attend a four-year college or university after they graduate from high school than their counterparts statewide.
- The exact reverse is true in terms of Green Bay students saying they plan to attend a Vocational-Technical college following high school. Senior students in the Green Bay Area School District are more likely to say they plan to attend a Vocational-Technical College than their counterparts statewide in Wisconsin.

Percent in 2016-17 Indicating Their Post High School Graduation Plans to Attend a Vocational-Technical College



- Given the rapidly changing nature of our economy, progressing into even higher levels of technological advancement, what steps could be taken to increase the percentage of students seeking the higher levels of education that will be needed to meet the anticipated jobs of the future?
- The greater Green Bay area is fortunate to have three unique and strong institutions of higher education. Northeast Wisconsin Technical College, St. Norbert College and the University of Wisconsin-Green Bay. Each may have a somewhat unique role to potentially play in the providing post-secondary education to meet the workforce needs of the greater Green Bay area.

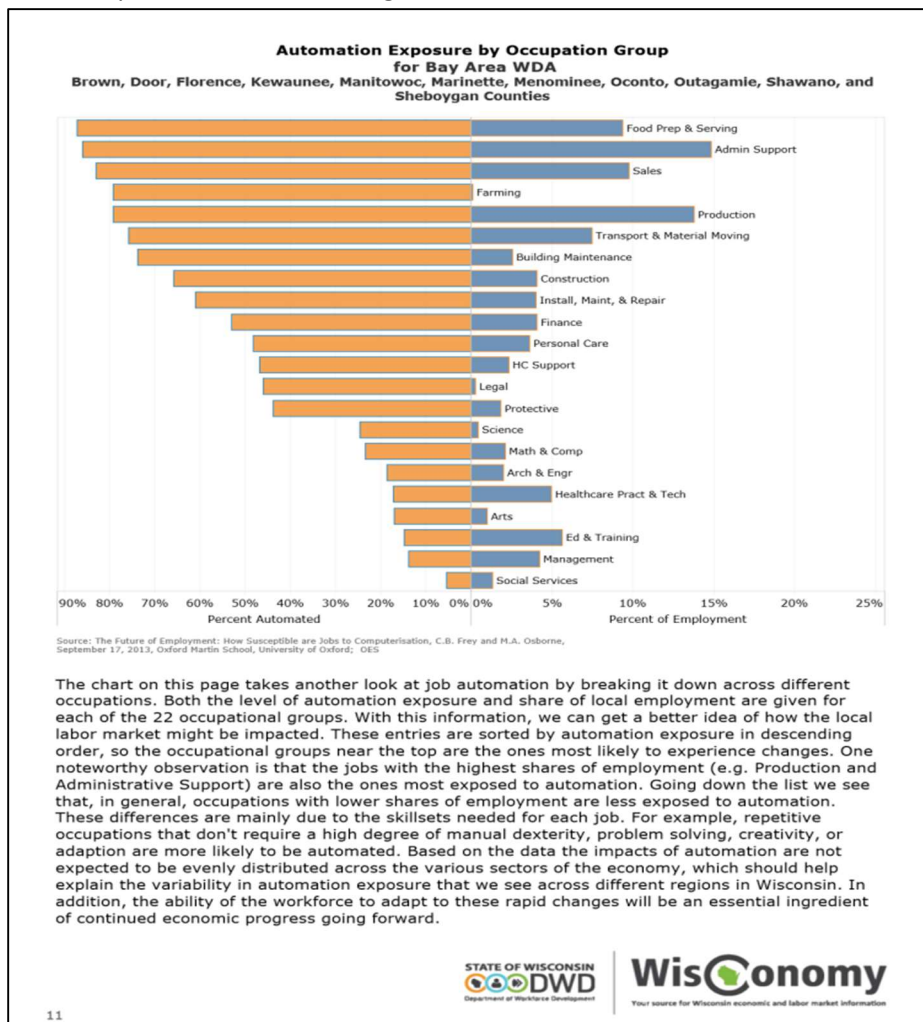


- The Brown County population mirrors the state in terms of educational attainment at all levels but lags behind the nation in the percentage of the population with Bachelor's degrees (-1.9%) and those with Master's degrees or higher (-3.1%).

Education Level Brown County, Wisconsin & United States 2018			
Area	Percent with High School Diploma	Percent with Bachelor's Degree	Percent with Master's Degree or Higher
United States	87.7%	31.5%	13.1%
Wisconsin	91.9%	29.5%	10.0%
Brown County	92.0%	29.6%	10.0%
Difference BC - US	+4.3	-1.9%	-3.1%
<i>Source: www.census.gov</i>			

#6: Three of the highest employment sectors in the Bay Area may be the most impacted by automation.

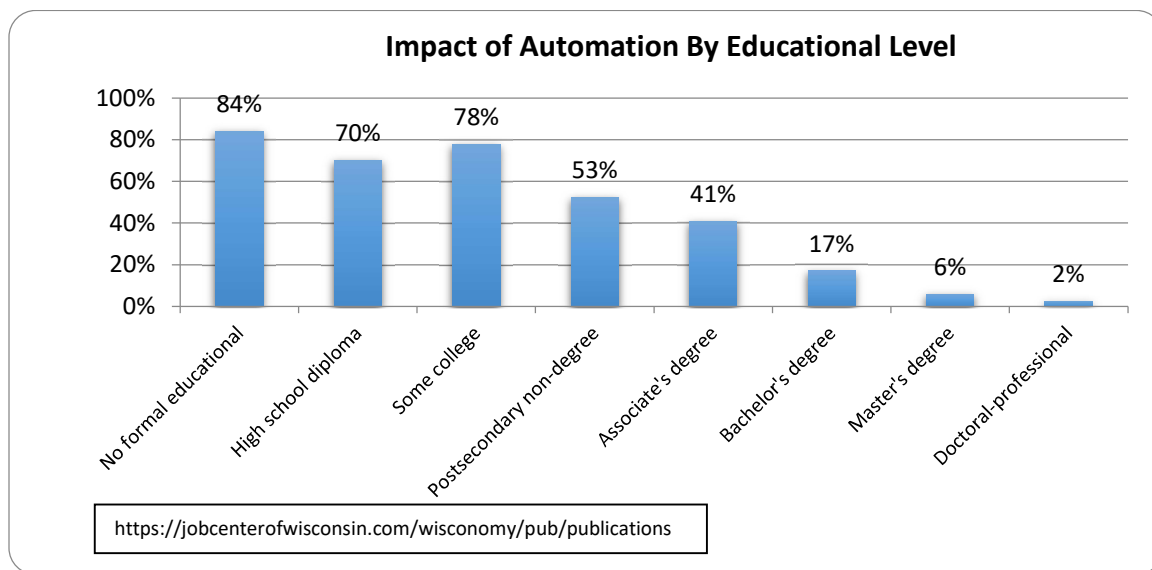
- Three of the employment sectors that play a prominent role in Bay Area employment are also sectors that may be the most vulnerable to automation: Production, food preparation & serving and transport & material moving.



- “The overall level of automation exposure is slightly higher in the Bay Area (63%) than it is for Wisconsin as a whole (60%). This difference is largely accounted for by comparing the occupational compositions between the two areas. The data reveals that the Bay Area has a relatively higher share of workers in occupations that have higher than average automation exposure, particularly in the fields of Production, Construction and Extraction, Food Preparation, and Sales. Conversely, the Bay Area also has a relatively lower share of employment in areas with less automation exposure such as Healthcare, Computer and Mathematics, and Business and Financial Operations.”
- “One noteworthy observation is that the jobs with the highest shares of employment (e.g. Production and Administrative Support) are also the ones most exposed to automation. Going down the list we see that, in general, occupations with lower shares of employment are less

exposed to automation. These differences are mainly due to the skillsets needed for each job. For example, repetitive occupations that don't require a high degree of manual dexterity, problem solving, creativity, or adaption are more likely to be automated.”²⁴

#7: Individuals with lower levels of education will be disproportionately impacted by automation.



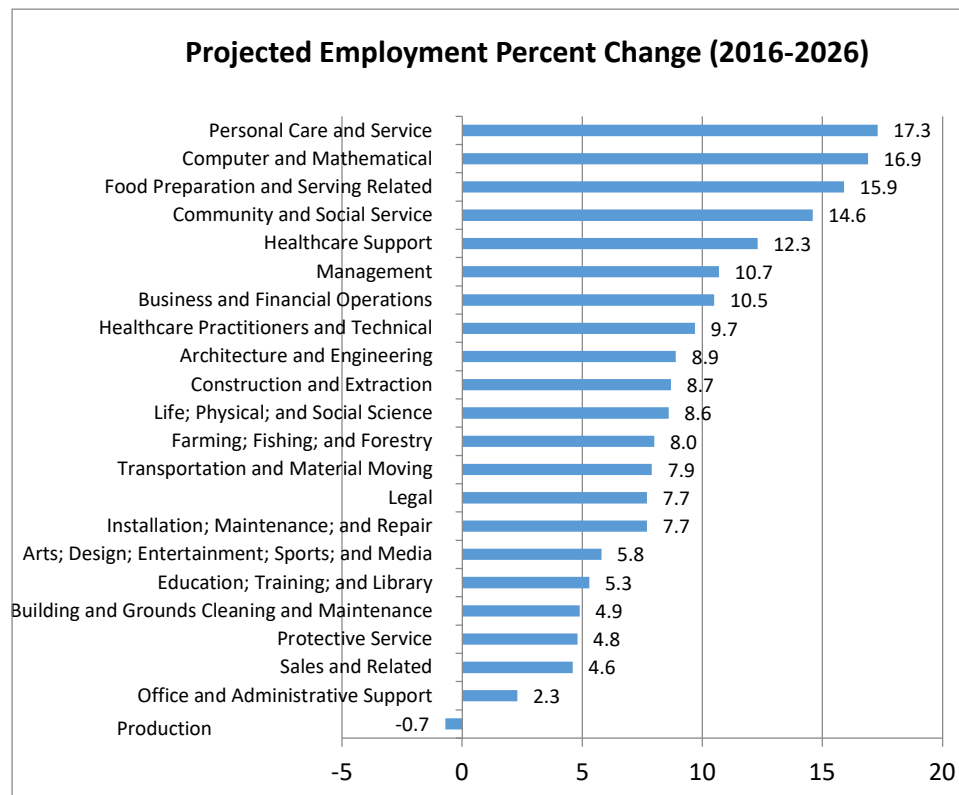
#8: Projected employment growth sectors draw attention to increasing inequities and different skillsets that will be needed in the greater Green Bay area workforce.

- Changes in the employment structure maybe leading to increased economic inequity. Income inequality in Wisconsin, as measured by the Gini Coefficient, is increasing. “Community leaders, scholars and activists are also trying to figure out why inequality is rising. One possible reason includes globalization and the “[financialization](#)” of developed economies, where professionals in the financial markets earn unusually high incomes. Another potential factor is skill-biased technological change, where industrial restructuring and the introduction of new technologies can lead to a decline in jobs and wages for unskilled workers. For example, manufacturing, which [has been in decline in Wisconsin](#) for years, has moved away from repetitive assembly using semi-skilled workers to computer-driven, robotic technologies that require higher levels of training and skill. On top of that, growth in the personal services industry, such as retail, restaurants and tourism, has created more low-paying jobs.”²⁵
- The highest employment growth areas call for somewhat different skillsets and educational level training. Employment sectors such as computer & mathematical, healthcare, business &

²⁴Long, Ryan. “2019 Workforce Profile: Brown County.” State of Wisconsin Department of Workforce Development. https://jobcenterofwisconsin.com/wisconomy/wits_info/downloads/CP/brown_profile.pdf.

²⁵ Deller, Steven. “Where In Wisconsin Is Income Inequality Most Pronounced?” Wiscontext. May 26, 2019. <https://www.wiscontext.org/where-wisconsin-income-inequality-most-pronounced>

financial operations, architecture & engineering and legal may require higher levels of formal technical education. Employment sectors such as personal care & support, food preparation & serving, community & social service and management may require more of the soft skills such as empathy, communication, emotional intelligence, etc.



Trends report: Technological advances – Phil Hauck 7-15-20

Blockchain

What is blockchain? It is an operating system that can run in the background of a software application for a transaction network. It is structured so that EVERY data entry is maintained. If an entry is wrong, you don't correct it. You make another entry that voids it, and then re-enter correctly. This visibility provides security from fraud and manipulation. Blockchain value is magnified when multiple parties are involved. Benefits in creating a blockchain network include reducing time to resolve disputes and process claims, and reducing potential for fraud in a transaction network, thus freeing up capital.

Many blockchain networks have already been created. To view an example, see [IBM Blockchain Platform](#). For details see [how to set up a network within a platform](#).

Why is it called blockchain? Each data entry is called a “block” and each block is connected in chronological order with the entries/blocks immediately before and after it, and can't be edited or changed. Also, the data chain does not reside on a single computer server, but exists independently in cyberspace (connected to you and your partners), as a “distributed database” accessible via the Internet. That means there isn't a central server which could be hacked or damaged. Blockchain was created (by a mysterious person under a fictitious name!) to rectify some of the weaknesses of the current approaches to documenting transactions, among them:

- Length of time between transactions and settlement
- Third-party validations always causing separate documentations referring back to the original
- High cost data entry such as credit card processing
- Lack of bank accounts, requiring even less secure and efficient transaction methods

Security, privacy and ability to integrate with business partners are important features of blockchain. Those who create or participate in the creation of the blockchain network are the only ones who have access to it. The creators can therefore integrate with business partners and not be susceptible to “all-seeing” intermediaries, as Ernst & Young calls them. By contrast, virtually all non-blockchain networks are controlled by a centralized source and can be hacked to expose information to the world.

Another advantage can be **speed**. Ernst & Young, regarding blockchain contract management: “The ability of *smart contracts* to handle a large number of different rules and agreements has helped us take cycle time for processing deals at one client from 45 days to less than a minute.” That's not typical, however (see below).

How is Blockchain being used today? Here are some examples:

- An April 30, 2020 US Senate staff memo talked about using blockchain for voting as well as for processing of the CAREs stimulus checks.
- West Virginia has tested using blockchain to facilitate voting in two counties. It worked well. Utah also tried it.

- Several states have created task forces to determine how it might benefit state administration needs.
- Pay-for-use blockchain applications are proliferating quickly. Amazon offers one of them.
- Walmart uses blockchain to track its shrimp product supply chain.
- In 2019, China accounted for well over half of blockchain application patent applications, marketing them across the world while the U.S. keeps questioning it.
- Entrepreneurs are bringing blockchain applications to hundreds of industries and niches: eSports, construction, real estate, health care, food safety, diamonds, travel, supply chain management (UPS tracing beef to Japan), digital payments.
- One blogger cited 19 industries that blockchain is already disrupting: banking and payments, cybersecurity, forecasting, insurance, charities, voting, energy management, and online music.
- Blockchain is a course of instruction in more than 50 universities, including MIT, Stanford and UCLA.

What about cryptocurrency applications of blockchain, such as Bitcoin?

In blockchain transactions, when “money is exchanged” it is done in Bitcoin, or another of the newly-created cryptocurrencies that partners in the transaction select. (Blockchain was created concurrently with Bitcoin, with Bitcoin being the original medium of exchange for blockchain transactions.)

Technology expert [Oliver Buechse](#), now the Digital Transformation Executive In Residence at UW-Green Bay, points out the negatives to use of Blockchain, primarily that it is fairly slow per transaction, about 10 minutes on average, because of the number of participants needing to react. In contrast, VISA performs transactions at 24,000 per second, but without security within the entire transaction sequence. It’s also difficult to pull together all the players in the value chain and get agreement on what the quality requirements will be. Thus, unless you’re developing a private network to secure a fairly short value stream, there will be typically be a large number of players involved.

Oliver Buechse’s more sanguine view: “Overall, I would argue that the outlook is overly optimistic as there are now very few uses due to key challenges. Hardly any cases use the original public blockchain concept described in the beginning. Most use a private block chain, which is watered down and does not uphold the promise of being intermediary free.”

Internet of Things (IoT)

Is Internet of Things here now, or will it be here shortly? IoT refers to the ever-growing network of physical objects that feature an IP address for internet connectivity, and the communication that occurs between these objects and other Internet-enabled devices and systems ([Webopedia](#)). It exists now in familiar applications: Alexa turning off the lights and locking the doors; home lighting controlled from an approaching car; Apple Watch working with a phone to bring many information sources to the wrist; an auto wayfinding system monitoring both traffic and weather and computing how far it is to a destination; smart appliances (stoves, fridges, coffee machines) in the kitchen. The Edge in Amsterdam is a smart building currently occupied by Deloitte which monitors the movements and activities of staff. Employees use an app that connects them to the building and which can direct them

to available working spaces, parking spaces, their colleagues, and even remembers how they prefer their coffee in the morning.

In the future, such applications and devices will be much more complex and ubiquitous. Some examples now being tested: automatically changing buildings' energy usage based on weather patterns; autonomous trucking over our highways; "smart" networks ensuring that a city's buildings, transportation system and infrastructure operate efficiently together (Songdo, South Korea); sensors feeding algorithms that manipulate water systems, street lighting, parks and fountains, bus routes etc., resulting in reduced traffic jams and pollution, as well as more efficient water, light and energy usage (Barcelona); a wearable medical system that connects a patient's vital signs with the doctor, pharmacy and visiting nurse.

Experts indicate that the advent of 5G (the term used to describe the next-generation of mobile networks beyond LTE mobile networks) and its attendant greater versatility and speed will accelerate the applications of IoT. That's already happening. In 2018, there were 7 billion IoT devices; in 2019, 26 billion. There are estimates that the value of the IoT marketplace will double from 2017 to 2021, to more than \$500 billion.

Next steps in IoT development include: improved ability of different systems to inter-connect with each other, by better integrating the system architectures that underlie them; improved power sources to meet the greatly increased needs of expanding device capabilities; and enhanced security. These are well underway, allowing IoT applications to advance fairly rapidly. Several states have initiated sweeping regulations over virtually everything that will be IoT related. California's, for example, encompasses everything from thermostats to TVs to fitness trackers, including their security requirements.

For those looking to develop IoT devices and applications, the Big Four mobile carriers are all active in developing inter-connectivity capabilities, and have services to assist you entrepreneurs with their ideas.

T-Mobile's focus is on asset tracking, smart city technology, smart buildings and vehicular fleet management, which makes sense, given that those areas are a natural fit for carrier-based IoT. All except smart buildings require a large geographical coverage area, and the ability to bring a large number of diverse endpoints from diverse sources onto the network is a strength.

AT&T, like the rest of the big four, does business both by selling their own IoT services – most of it under the umbrella of the Multi-Network Connect platform, a single pane of glass offering designed to streamline the management of many types of IoT product – and by partnering with an array of hardware and other product makers who want to use the company's network.

Verizon's IoT platform, and the focus of its efforts to do business in the IoT realm is Thingspace, which is similar to AT&T's MNC in many respects. The company also offers both NB-IoT and LTE-M for flexible IoT-specific connectivity options, as well as support for traditional SIM-based networking. As with the rest of the big four, Verizon also sells connectivity services to third parties.

Sprint's IoT offerings are partially provided under the umbrella of the company's IoT Factory store, and the emphasis has been on various types of sensor-based service, including restaurant and food-service storage temperatures, smart building solutions for offices and other commercial property, as well as fleet management for terrestrial and marine vehicles.

Other examples of companies offering IoT services today:

Oracle's IoT Connected Worker Cloud service lets companies monitor the locations of their employees in hazardous environments, alerting and notifying workers whenever they approach particular dangers or hazards, as well as controlling access to restricted and potentially dangerous areas.

Intel produces a range of wearable devices which have been used by fire and rescue services to track where exactly firefighters are in a building or environment, so that they can easily be assisted if in danger or redeployed to different areas.