



Preparing Wisconsin for the Future of Work

Advancing AI Wisconsin - January, 2018 Perspective

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Artificial Intelligence has the potential to be extremely disruptive to the labor market. While there are multiple perspectives on the future, a study by Oxford stated that 47% of the current tasks performed by American workers are expected to be automated¹. AI will have positive impacts, but also will present multiple challenges. On the positive side, according to a study by Accenture, it is anticipated that the annual economic growth rate will nearly double by 2030. This means that like prior automation trends, higher productivity and standards of living will follow. In fact Accenture estimates that productivity will rise by 40%². However, there is no doubt that the transition will be painful for both organizations and individuals whose livelihood is disrupted.

As a result, we need to prepare the next generation of workers (K-University) for the new workplace requirements. In addition, we need to determine how to best re-skill the existing population. This paper is not intended to provide all of the answers, but rather as a basis from which to start the discussion on how to best prepare our workforce of the future for this new reality.

Let Humans Be Humans!

The World Economic forum states that 65% of children entering primary school today will ultimately end up working in jobs that don't yet exist. So, how do we prepare students? Ultimately, the most important skills will be those which are uniquely human. In the Future of Jobs report, the World Economic Forum put forward the following as top skills that will be required in the future³:

¹ Chelliah, J. (2017). Will artificial intelligence usurp white collar jobs? *Human Resource Management International Digest*, 25(3), 1-3

² Accenture. (2016). Artificial intelligence is the future of growth. Retrieved from <https://www.accenture.com/us-en/insight-artificial-intelligence-future-growth>

³ The Future of Jobs - World Economic Forum. (2017). Retrieved from http://www.bing.com/cr?IG=75CB0A318C75450B9392563F2FDCCB43&CID=2C612C9BB80E632214B527C7B9A162E1&rd=1&h=tlj92LP4Kj0HL6Y9W_s1Jl2rcUTONwN8u8pEWgnyiE&v=1&r=http%3a%2f%2fwww3.weforum.org%2fdocs%2fWEF_Future_of_Jobs.pdf&p=DevEx,5069.1

Top 10 skills

in 2020

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility

in 2015

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment and Decision Making
9. Active Listening
10. Creativity



Source: Future of Jobs Report, World Economic Forum

Reviewing this list may be surprising to some as technology is not even included in the top ten skills. Instead, listed are skills which are not possible to automate (at least for the foreseeable future!).

But Humans Must Interact with Technology

So, while technology is not listed in the World Forum listing, there are not many jobs posted for “problem solver” or “critical thinker”. These skills must be applied in a domain specific way. So, what are the jobs of the future? We’ll review from three different perspectives.

The first requirement is to understand the requirement for digital skills in the economy today. A 2017 report by the Brookings Institute shows that digital competence is now required for the majority of jobs. Between 2002 and 2016, the number of jobs with a medium to high degree of digital content increased from 44.3% to 70.5% of available employment. Increasingly, this is also the pathway to higher income roles with the mean annual wage for workers in highly digital occupations reaching \$72,896 in 2016 vs low digital jobs with a mean annual wage of \$30,393.⁴

The second approach is to review the jobs with the fastest rates of growth. According to US Department of Labor’s list of top growing jobs for 2017, almost all have some basis in science or technology⁵:

⁴ Muro, M., Liu, S., Whiton, J., & Kulkarni, S. (2017, November 17). Digitalization and the American workforce. Retrieved from <https://www.brookings.edu/research/digitalization-and-the-american-workforce/>

⁵ U.S Department of Labor Statistics. (2017, October). Fastest Growing Occupations: Occupational Outlook Handbook. Retrieved from <https://www.bls.gov/ooh/fastest-growing.htm>

OCCUPATION	GROWTH RATE, 2016-26	2016 MEDIAN PAY
Solar photovoltaic installers	105%	\$39,240 per year
Wind turbine service technicians	96%	\$52,260 per year
Home health aides	47%	\$22,600 per year
Personal care aides	37%	\$21,920 per year
Physician assistants	37%	\$101,480 per year
Nurse practitioners	36%	\$100,910 per year
Statisticians	33%	\$80,500 per year
Physical therapist assistants	31%	\$56,610 per year
Software developers, applications	30%	\$100,080 per year
Mathematicians	29%	\$105,810 per year
Bicycle repairers	29%	\$27,630 per year
Medical assistants	29%	\$31,540 per year
Physical therapist aides	29%	\$25,680 per year
Occupational therapy assistants	29%	\$59,010 per year
Information security analysts	28%	\$92,600 per year
Genetic counselors	28%	\$74,120 per year
Operations research analysts	27%	\$79,200 per year

The third angle is to review trends for the future. One of these trends is the growth of artificial intelligence. McKinsey estimates that approximately \$40B was invested in AI development in 2016 by tech giants and startups, but that rate has grown by over 40% from the 2013 level and it is only expected to accelerate.⁶ PwC research validates this view and expects that AI will contribute \$15.7 Trillion to the global economy by 2030.⁷

Combining these three trends led Northeastern University president, Joseph Aoun, to conclude that in the future, individuals will need to be educated in humanics which includes data literacy, technological literacy, and human literacy. Students will need data literacy to manage the flow of big data, and technological literacy to know how their machines work, but human literacy—the humanities, communication, and design—to function as a human being. Together these skills will enable humans to work productively in conjunction with automated systems.⁸

Jobs will Certainly be Lost

Unfortunately, change is never easy. It can be downright disruptive to the individuals involved. So, how do you best prepare for available jobs and be positioned for future role requirements? The first way is to understand the characteristics of the roles. KPMG provided an

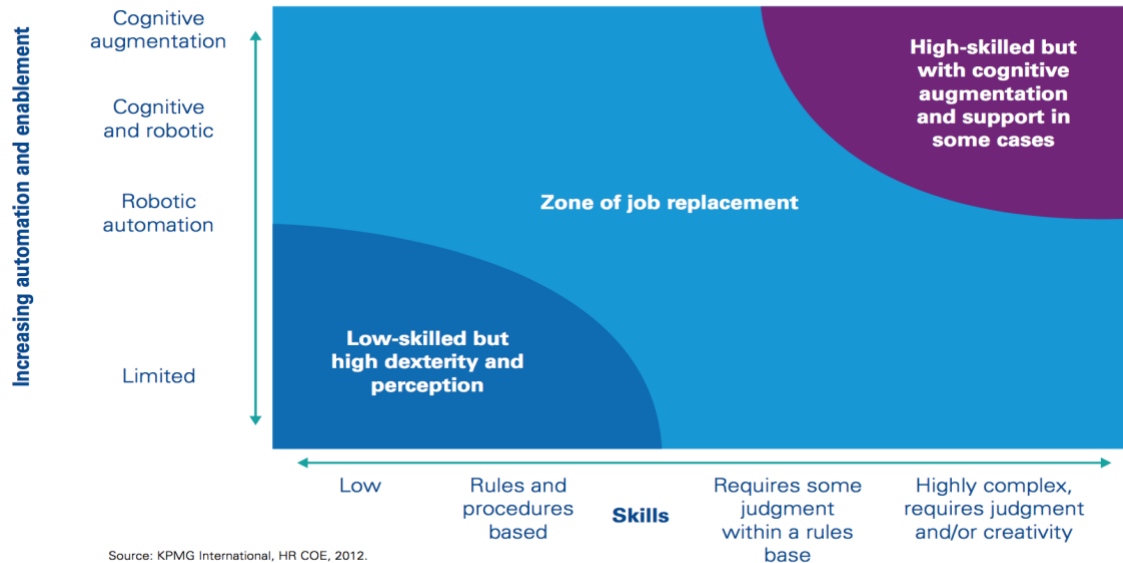
⁶ McKinsey. (2017, June). Artificial Intelligence the Next Digital Frontier? Retrieved from <https://www.bing.com/cr?IG=F5A12C42704D4A6783CF6C1C3F27F79C&CID=224E3B85E0776243340930D8E1D863E1&rd=1&h=QR e5A5NtrNp6l5MegkOIQaWVM9qjXSceU5TSInOB4g&v=1&r=https%3a%2f%2fwww.mckinsey.com%2f%7e%2fmedia%2fMcKinsey%2fIndustries%2fAdvanced%2520Electronics%2fOur%2520Insights%2fHow%2520artificial%2520intelligence%2520can%2520deliver%2520real%2520value%2520to%2520companies%2fMGI-Artificial-Intelligence-Discussion-paper.ashx&p=DevEx,5065.1>

⁷ PricewaterhouseCoopers. (2017). PwC's Global Artificial Intelligence Study: Sizing the prize. Retrieved from <https://www.pwc.com/gx/en/issues/data-and-analytics/publications/artificial-intelligence-study.html>

⁸ Aoun, J. E. (2017, August 17). Robot-Proof. Retrieved from <https://mitpress.mit.edu/books/robot-proof>

excellent graphic to help us understand the types of roles which are likely to be automated in the future⁹:

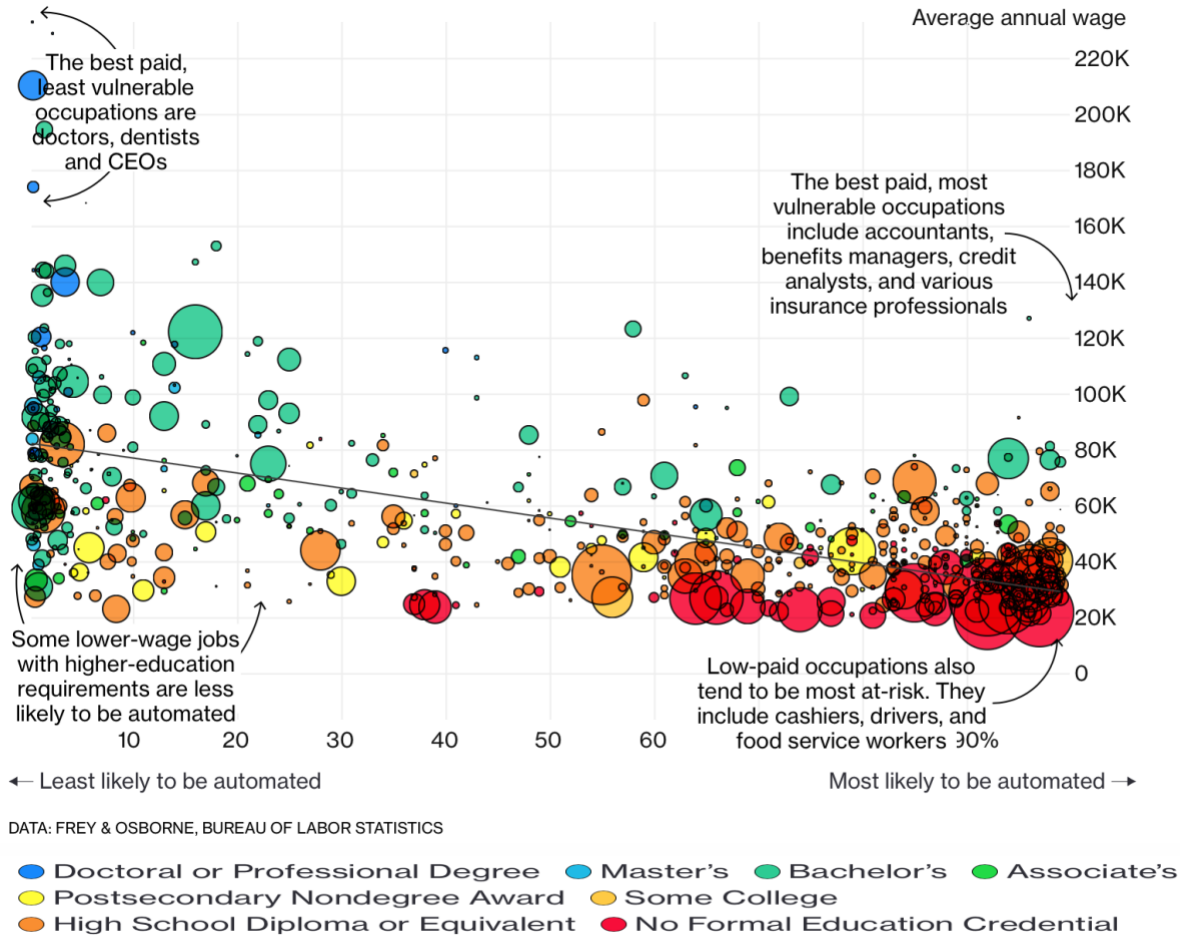
Figure 2: Job impacts of cognitive processing and robotic automation: The hollowing out of the workforce



When translated to job titles and educational levels, a couple of patterns emerge.¹⁰ First, education is the best defense against automation. The graph from Frey and Osborne utilizing Department of Labor Statistics shows that the higher levels of education typically results in higher income and lower potential for complete automation. Second, while portions of existing jobs will likely be automated, there will likely continue to be some human element including interpretation, discussion, and decision making. Finally, if past automation trends hold true, automation will lead to lower cost services and goods which will in turn lead to higher demand which leads to more jobs. For those jobs with a high likelihood of automation, it is important to develop skills which enable the worker to interface and derive value from the automation system.

⁹ KPMG. (2017). Rise of the Humans. Retrieved from <https://home.kpmg.com/us/en/home/insights/2017/09/2017-issue3-article3.html>

¹⁰ Whitehouse, M., Rojanasakul, M., & Sam, C. (2017, June 22). Is Your Job About To Disappear?: QuickTake. Retrieved January 05, 2018, from <https://www.bloomberg.com/graphics/2017-jobs-automation-risk/>



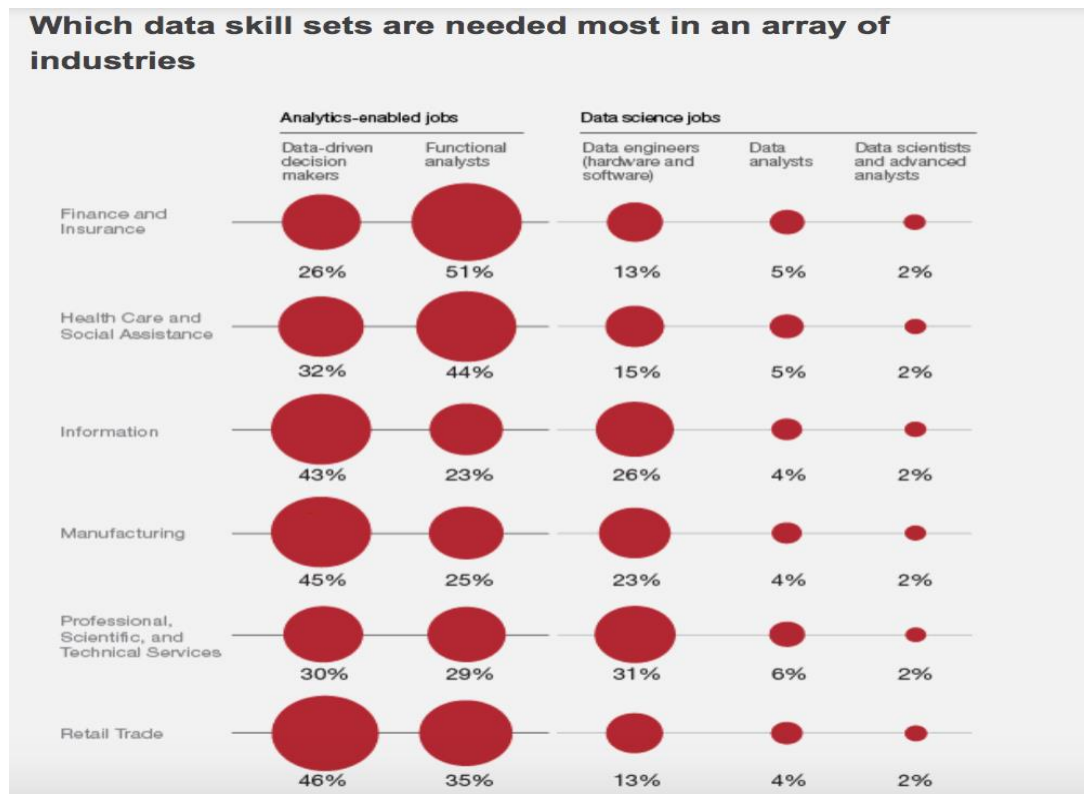
As jobs are automated, this will require the reskilling. In a talent-scarce workforce, retraining programs will need to be designed for existing employees in order to retain key domain specific skills.

However, New Jobs will be Created

While no one is claiming an ability to completely predict the future, MIT came out with an interesting study which pointed to the new types of jobs which may be created in the future. There were three general types which were referenced: Trainers, Explainers, and Sustainers¹¹. Trainers will teach the AI systems how to perform work. Explainers will help bridge the gap between the technologists and the business to help them understand how and why the artificial intelligence system is making the recommendations. Finally, the Sustainers will validate that the artificial intelligence program is working as intended and, if not, to change it quickly. Each of these require an understanding work tasks being automated by artificial intelligence and data sources.

¹¹ Wilson, H., Daughter, P., & Morini-Bianzino, N. (2017). The Jobs That Artificial Intelligence Will Create. Retrieved December 19, 2017, from <https://sloanreview.mit.edu/article/will-ai-create-as-many-jobs-as-it-eliminates/>

This is also reinforced by the number of data related roles in the future. For example, a study by PWC shows that there will be 2.9M job openings which require data analytics skills in 2018 which is a 25% increase from 2015. In addition, 69% of the employers state that they will prefer candidates with data analysis skills. However, this does not exclusively mean data scientists or data engineers, but rather includes domain specific experts who also have data analytical skills as demonstrated below:¹²



So We Must Prepare

While many are starting to identify the need for the development of a talent pipeline to meet the future workforce demands, the specific requirements are still being defined. However, given Brookings research which showed the growth digital roles, there are several assumptions that we can make:

1. Digital competency will increasingly be a base requirement for participation in the labor force including an ability to collaborate with digital assistants
2. Highly digital roles, such as AI developers, application coders, and data scientists will continue to be a pathway to a good job

¹² PricewaterhouseCoopers. (2017). What's next for the 2017 data science and analytics job market? Retrieved from <https://www.pwc.com/us/en/publications/data-science-and-analytics.html>

3. New, domain specific, roles will be developed which require an understanding of data-informed decision making and artificial intelligence
4. Uniquely human skills including creative, collaborative, problem-solving, and empathetic skills will be required.

These four principles can be applied as we consider how to design talent development programs for K-12, post-secondary education, and industry retraining.

1. K-12 Education

One of our top priority needs to be to create a student population who is interested in applied data analytics and who have access to programming which helps them develop skills. In November, 2017, Virginia made history by becoming the first state to require computer coding in their curriculum. Three other states (WV, TX, and AR) require that all high schools offer computer science.¹³ Wisconsin has adopted Computer Science Standards for K-12 Education, but these are optional and subject to district resources and investment trade-offs.¹⁴ In addition, there are many nonprofits working to increase interest such as [Girls who Code](#), [First Lego League](#), and [Future City Competition](#). However, these programs are often optional and not accessible to all.

Success in our K-12 system requires a programmatic, comprehensive approach to developing the skills for tomorrow. A good example of developing a comprehensive approach to talent development is the School District of New Berlin which is highlighted below.

Case Study: School District of New Berlin (SDNB), Waukesha County¹⁵

In the State of Wisconsin, all K12 districts are required to implement an Education for Employment plan. This ensures that all students are prepared to participate in the workforce at the point in time that is right for them based on their personal, academic, social and career goals. Students are to be provided with career exposure at the elementary level and Academic and Career Planning services in grades 6-12. Preparing students for the impact of disruptive technologies on the world of work should be a key component of every district's Education for Employment plan so that students are truly informed consumers of their post-secondary education and/or training.

Similar to the information previously introduced on "humanics"¹⁶, this includes:

¹³ Sawchuk, S. (2017, November 22). Virginia Becomes First State to Require Computer Science Instruction. Retrieved January 05, 2018, from http://blogs.edweek.org/edweek/curriculum/2017/11/virginia_mandates_computer_science_learning.html

¹⁴ Axelson, J. C. (2017, July 19). New Wisconsin K-12 standards intended to spur interest in computer science careers. Retrieved from <https://www.jsonline.com/story/news/education/2017/07/19/new-wisconsin-k-12-standards-intended-spur-interest-computer-science-careers/472682001/>

¹⁵ Schmidt, L. (January 2018), Strategic Advisor to the Superintendent, School District of New Berlin, Direct Contribution

- Data Literacy (deriving meaningful information from data as opposed to the written word). In the SDNB, this is delivered through
 - K12 Math and Science Instruction
 - Project Based Learning (embedded in coursework)
 - Statistics and Applied Data Analytics (currently encouraged but optional)
- Technological Literacy (knowledge about the nature, behavior, power and consequences of technology from a real-world perspective). In the SDNB, this is delivered through ...
 - Digital citizenship (the appropriate, responsible, and ethical use of technology)
 - Digital learning (use of technology in teaching and learning)
 - Maker culture (access to tools and techniques that allow students to ideate, design, prototype, evaluate, and reflect on solutions to relevant issues)
 - Computer Science ([AP Computer Science](#), [AP Computer Science Principles](#) develop agile methodologies, application of technology across industry segments, impact of disruptive technologies, software and computer programming and engineering, etc.)
 - Information Technology (concepts in cybersecurity, networking, customer support)
 - How Machines Work (course demonstrates the impact of technology on one of Wisconsin's key industries by exposing students to both traditional and advanced manufacturing including the application of automation and Industry 4.0 (IIoT)).
- Human Literacy (humanities, communication, and design). In the SDNB, this is delivered through
 - Strong foundation of a liberal arts education
 - Strong engineering curriculum focused on design and systems thinking
 - Grading of dispositions for success including communication, collaboration, perseverance, critical thinking, etc. to allow teachers and parents to develop these skills in partnership with one another.
 - [Advanced Innovation and Design](#) - capstone course designed as an entrepreneurial skills accelerator with challenges designed employ technical solutions to real world problems.
- Career Awareness and Preparation. In the SDNB, this is delivered through
 - Academic and Career Planning (grade level outcomes met by advisory teachers and counselors)
 - Course connections (all teachers receive professional development to connect what students are learning to the world of work)
 - College and Career Readiness events (industry tours, career days, field study)
 - Career and Service based learning opportunities (i.e. mentorships, internships, apprenticeships)

¹⁶ Aoun, J. (2017). *Robot-proof: higher education in the age of artificial intelligence*. Cambridge, MA: The MIT Press.

This level of planning is intended to ensure that priority skills are addressed in the SDNB's Vision of a College and Career Ready graduate and supported through the opportunities made available to students as outlined in Ask About AI: The Future of Work and Learning.¹⁷



While New Berlin is a fantastic example of what is possible, there are still too few school districts with a comprehensive approach to K-12 educational preparation. In fact, fewer than 40% of schools nationwide even have the resources to offer computer science courses.¹⁸ Some of the inhibitors to comprehensive offerings include teacher availability and funding. One program to help address this shortage is [TEALS](#) which integrates volunteer technology professionals into the classroom in order to help overcome this barrier. In addition, research is needed to determine how to objectively measure humanics skills associated with data, technological, and human literacy.

2. Post-Secondary Level

One area where talent development is required is to build a talent pipeline for the skills of designing, programming, and implementing artificial intelligence systems. This includes everything from data preparation to the writing of algorithms. Some of the specific programs available to learn these new innovative technologies include the following:

1. Degrees available at Universities in Wisconsin
 - a. Data Science/AI Specific Undergraduate Degrees
 - i. [UW River Falls Data Science and Predictive Analytics](#)
 - b. Data Science/AI Specific Graduate Degrees:
 - i. [UW Madison: Masters in Data Science](#)
2. Degrees available at reciprocal Minnesota

¹⁷Vander Ark, T. (2017, November 30). Ask About AI: The Future of Work and Learning. Retrieved from <http://www.gettingsmart.com/2017/11/ask-about-ai-the-future-of-learning-and-work/>

¹⁸Axelson, J. C. (2017, July 19). New Wisconsin K-12 standards intended to spur interest in computer science careers. Retrieved from <https://www.jsonline.com/story/news/education/2017/07/19/new-wisconsin-k-12-standards-intended-spur-interest-computer-science-careers/472682001/>

- a. Data Science/AI Specific Undergraduate Degrees
 - i. [Winona State Data Science Degree](#)
 - b. Data Science/AI Specific Graduate Degrees:
 - i. [U of MN Carlson Business School Masters Business Analytics](#)
3. Special Programs for innovation with both students and external organizations
- a. [Artificial Intelligence Lab at MSOE](#)
 - b. [Connected System Institute at UW Milwaukee](#)
 - c. [Internet of Things Lab at UW Madison](#)
 - d. [UW Artificial Intelligence Research](#)
 - e. [Blockchain lab at Marquette](#)

In addition, data literacy will increasingly be required in many domain specific areas which provides the opportunity for cross-disciplinary education at the post-secondary level. Several business programs in Wisconsin universities are working to integrate data competency into their programs.

Wisconsin's technical colleges have an important role to play in preparing for the era for artificial intelligence. Technical colleges offer a multitude of degrees from mechatronics and engineering to advanced manufacturing and data analytics. Driving artificial intelligence is information technology and the software programming that serves as its foundation. Technical colleges are well known for their advanced cyber security, computer programming and languages and Software application degrees. Students that attend a Technical College are provided career planning and preparation services that build pathways for internships and jobs related to their field of study. In addition, the WTCS is advancing a new Industry 4.0 curriculum focused on automation, analytics, and IIoT. Students prepared with these competencies will be well prepared for working in Smart Factories where Artificial Intelligence and other disruptive technologies will most certainly be employed. These new career pathways are intended to ensure that students graduate ready to work in the new world of Advanced Manufacturing and will allow students to expedite time and minimize the cost of completing a 4 year engineering degree for those students who choose to continue their education.

One critical aspect of these programs includes experiential learning opportunities which benefit both organizations and students. According to Northeastern's president, Joseph Aoun, experiential learning in co-op programs help make students more "robot-proof" by sharpening cognitive capacities including creativity and by developing a growth mindset. Experiencing different situations and contexts challenges beliefs and requires application of principles. In a scientific study by Northeastern to measure the effectiveness of the co-op programs, students who had participated in co-ops were rated significantly higher on "robot-proof" skills of leadership, initiative, teamwork, flexibility, and creativity.¹⁹ In addition to being important for students, experiential learning opportunities are increasingly important to an employer's talent acquisition strategy. In fact, 51.3% of interns turn into long term hires and 51.8% of those stay five years.

¹⁹Aoun, J. (2017). *Robot-proof: higher education in the age of artificial intelligence*. Cambridge, MA: The MIT Press. Chapter 4

However, reviewed from a perspective of interns who were offered a full time job after an internship, 90% accepted the role.²⁰ When experiential learning is part of a facilitated process of knowledge acquisition, integration, and application, transfer rate of skills improves and employers benefit.

In addition to formal post-secondary degree programs, credentials are increasingly being utilized to quickly develop the skills required to meet employer requirements in these areas. Some examples include open source education from popular MooCs, such as:

1. [Udacity AI Nanodegree](#) , [Deep Learning A-Z Hands on Artificial Neural Networks](#) , [Artificial Intelligence Reinforced Learning in Python](#)
2. [edX Artificial Intelligence Course](#)
3. [Coursera Machine Learning](#), [Machine Learning Projects](#), [Deep Learning for Business](#)

Technology providers also provide free training, some of which includes credentialing:

4. [IBM Badge training](#) including AI and Blockchain
5. [Microsoft Training site including AI](#)
6. [Salesforce Einstein Discovery - Easy AI and Machine Learning](#)

These open source courses can be utilized either by traditional students to augment formal education with cutting-edge skills not offered by their post-secondary institutions, or by existing employees to transition to new roles.

Finally, we need to be new educational models which combine K-12 and post-secondary education. One extremely successful model, which was developed in conjunction with IBM, is the P-Tech program with over 80 schools now in operation. The [P-Tech](#) is a K-14 educational model which is collectively sponsored by a school district, technical education institution, and industry partner. The goal is for every student to gain an associates degree in a high demand field like cyber security, analytics, etc. The report card on these schools is extremely positive with over 80% of the students who enrolled in grade 9 graduating with their associates degree which is far higher traditional educational models.²¹

3. Corporate Re-Skilling

Increasingly, organizations are recognizing that talent pipeline will need to include re-training of their existing workforce based on demographics and domain specific skills requirements. In fact, when surveyed by Deloitte, only 20% of HR and business leaders stated that they expected to reduce any jobs due to automation. Instead, 77% said they would either retrain people to use the new technology or redesign jobs to take advantage of uniquely human skills in collaboration with machines, thus taking advantage of the unique strengths of each.²² Therefore, the most productive implementation of automation include input from existing teams. To uncover opportunities, the

²⁰ Nace. (2015, July 21). Intern to Full-Time Hire Conversion: “Returning” vs. “Non Returning” Interns. Retrieved from <http://www.naceweb.org/talent-acquisition/internships/intern-to-full-time-hire-conversion-returning-vs-nonreturning-interns/>

²¹ Davis, R. (2018, January 5). P-TECH Transformation by Percentages and Numbers. Retrieved from <https://www.linkedin.com/pulse/p-tech-transformation-percentages-numbers-rashid-ferrod-davis/>

²² Abbatiello, A., Boehm, T., Schwartz, J., Chand, Sharon. (2017, December 05). No-collar workforce: Humans and machines in one loop-collaborating in roles and new talent models.. Retrieved from <https://www2.deloitte.com/insights/us/en/focus/tech-trends/2018/no-collar-workforce.html?id=us%3A2sm%3A3tw%3A4t18%3A5eng%3A6cons%3A20180107%3Att18%3ADeloitteTalent&linkId=46584228>

existing workforce will need to increase their digital competency in order to understand potential applications of technology. Once trained, visionary organizations should be assessing the following in conjunction with their line employees and leaders:

- a. Existing processes to determine routine components with automation potential
- b. Existing and future role definition to determine the responsibilities of automation bots and new human responsibilities
- c. New skills requirements defined based on modified responsibilities
- d. Existing workforce skills, aspirations and potential
- e. Training plan to build new skills in the existing workforce
- f. Small implementation success and challenges and modify plans accordingly
- g. Methodology for managing joint interaction including performance metrics and incentives.

In addition to the corporate commitment to retaining the workforce, workers will also need to invest their time into continual re-skilling. Gone are the days that we can go sequentially from school to career. Given that the current half-life of skills is now only five years,²³ workers will need to commit to lifelong learning in order to remain relevant in the job market.

Building the Future of Work

While there are many positive, individual efforts underway to help prepare for the future, to scale, we must consider holistic changes to accelerate our educational efforts at the same pace as the technology. To do so, requires work from multiple stakeholders jointly invest in re-shaping the future of work according to Rafael Reif, President of MIT. In his kick-off to the Future of Work event, he declares preparation for the next generation of work the grand challenge of our generation which will require bold investment from multiple stakeholders including:²⁴

1. Labor Unions - Can new apprenticeships be created? Can they negotiate re-skilling programs into labor contracts?
2. Government Laws - Can there be new incentives created for employers to invest in skills development and to located in hard hit regions?
3. K-12 - Can we make sure that every graduate is computationally literate?
4. Industry - Can they invest savings from automation in retraining workers?
5. Higher Education - Can students be taught to balance efficiency with other human values, from the projects that they select to how they design solution?
6. Workers - Can they help create complementary work which benefits their organizations, but also augment humans versus making them obsolete?

Similarly, in “Hit Refresh” by Microsoft CEO, Satya Nadella portrays economic growth in the form of a mathematical equation: (Education + Innovation) x Intensity of Tech Use =

²³ Keijzer, P. (2017, May 09). The Crisis of Shrinking Half-Life of Skills. Retrieved January 05, 2018, from <http://www.paulkeijzer.com/crisis-shrinking-half-life-of-skills/>

²⁴ Reif, R. (2017, November). Preparing for the Future of Artificial Intelligence. Retrieved from http://projects.csail.mit.edu/video/talks/cap/futureofwork/01_Opening_Remarks.mp4

Economic Growth. With this in mind, he provides several recommendations on how each organization can contribute to this educational success:²⁵

1. K-12 Schools: Promote of digital literacy as a base requirement for all graduates and provide access to technology for all teachers and students
2. Post -Secondary: Develop close relationships to industry to define programs and prepare to meet the needs of the non-traditional, older student displaced by technology
3. Government: Embrace technology to lead by example, improve services, and reduce costs and direct funding for education based on regional economic development strengths and priorities
4. Industry: Invest in lifelong learning for digital-ready workforce and apprenticeships, similar to Germany, where workers receive training in cutting edge technology

In conclusion, new, disruptive innovations have the potential to both improve quality of life and work. Prior technological improvements have led to safer jobs, fewer hours, and more rewarding work. Artificial intelligence is expected to do the same. Therefore, this should not be a debate on whether we should encourage new technologies, as innovation will occur either domestically or internationally. Rather, we need to prepare our workforce to capitalize on these trends and lead us into a secure future for generations to come.

²⁵ Nadella, S. (2018). *Hit Refresh*. S.I.: William Collins.