NEW NORTH BUSINESS INTELLIGENCE
FORWARD-LOOKING REGIONAL STRATEGY THINK-TANK WORKSHOP

KEY DRIVERS ANALYSIS REPORT

December 2019

NEW NORTH BUSINESS INTELLIGENCE FORWARD-LOOKING REGIONAL STRATEGY

KEY DRIVERS ANALYSIS REPORT

This report summarizes the driver analysis undertaken at the scenario planning session held in Appleton, Wisconsin, on August 9, 2019. Approximately 55 New North stakeholders participated in the scenario-based strategy Think-Tank workshop. This report has been produced as part of the New North Business Intelligence strategic planning process, which aims to provide forward looking business intelligence for both businesses and non-profits in the region to be able to plan more effective strategic action for economic growth and prosperity.

December 2019

Report Prepared by:

future→iQ®

Create **Future Intelligence**®

Think-Tank Hosted by:

New North, Wisconsin

TABLE OF CONTENTS

1.0   INTRODUCTION

The Next Industrial Revolution is being driven by the systemic transformation of technology, information and innovation on a global scale. As part of preparing the region for Industry 4.0, New North, Inc has undertaken work to identify critical drivers shaping the future of their region's industry and manufacturing base. This report summarizes the key driver analysis undertaken at the scenario planning session held in Appleton, Wisconsin, on August 9, 2019. Approximately 55 New North stakeholders participated in the scenario-based strategy Think-Tank workshop. The Think-Tank participants were asked to identify and consider the key drivers impacting New North business intelligence with respect to the two themes that formed the axes of the scenario matrix framework, Workforce and the Workplace and Digital Transformation. Drivers were defined as events, trends, developments, catalysts or forces that actively influence or cause change.

In exploring the drivers, workshop participants discussed and recorded answers to the following questions for each of the 20 top drivers:

- Key emergent high-level trends (including sources where possible).
- Potential impacts of these trends on industry in New North region out to 2030?
- What are the big FUTURE-SPLITTING QUESTIONS for this driver?
- Future insights - your predictions for how this topic will play out in the future.
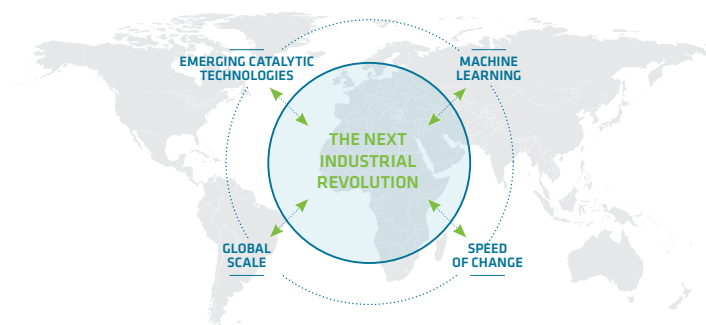
This summary report has been produced as part of the New North Business Intelligence strategic planning process, which aims to provide forward looking business intelligence for both businesses and non-profits in the region to be able to plan more effective strategic action for economic growth and prosperity.

"All of us need to understand that quantum change is happening and that preparing for it is our collective duty. Technology's march toward the future is inevitable. What's not inevitable is the quality of our preparedness. We all have some work to do."

"We're at the Dawn of the Fourth Industrial Revolution"
- Tim Pawlenty, (Former Governor of Minnesota, 2003-2011). Star Tribune, 2 June 2017

Will business leaders be willing to make the decisions necessary to transform their businesses and meet the challenges of the future, or will they fall behind?

FUTURE-SPLITTING QUESTIONS ™
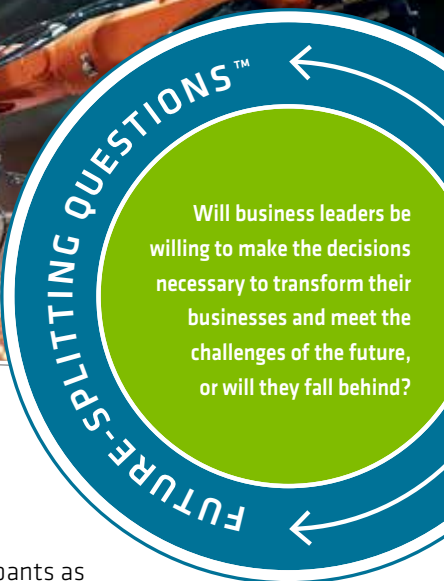
2.0 DIGITAL TRANSFORMATION

2.1 DIGITAL MANUFACTURING

The impact of new technologies on digital manufacturing was considered by Think-Tank participants as the key trend influencing this driver. It has been stated that "...digital manufacturing technologies will transform every link in the manufacturing value chain, from research and development, supply chain, and factory operations to marketing, sales and service." *(1. Brian Hartmann, William P. King,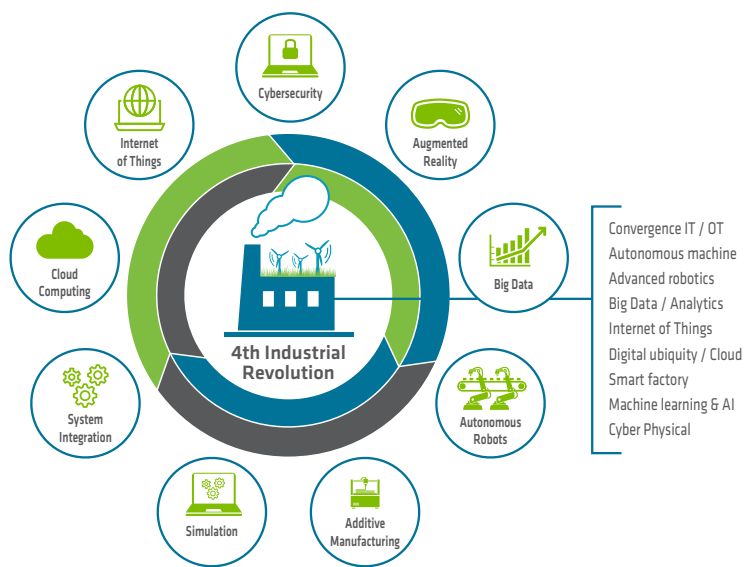 and Subu Narayanan, Digital manufacturing: The revolution will be virtualized, McKinsey Digital, August 2015.)* Of particular importance will be the integration of new technologies within the Industry 4.0 framework.

Industry 4.0 - Convergence of Technologies

Cybersecurity

Internet of Things

Augmented Reality

Cloud Computing

Big Data

4th Industrial Revolution

System Integration

Autonomous Robots

Simulation

Additive Manufacturing

Convergence IT / OT
Autonomous machine
Advanced robotics
Big Data / Analytics
Internet of Things
Digital ubiquity / Cloud
Smart factory
Machine learning & AI
Cyber Physical

Source: Industrie 4.0: The fourth industrial revolution – guide to Industrie 4.0

Potential impacts of these trends on industry in the New North region out to 2030:

- Winners will adopt technologies faster and more effectively.
- New North region has high collaboration skills, which could aid and accelerate adoption of technologies.
- Educational institutions will need adapt or be antiquated.
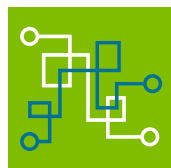
FutureInsight

FUTURE PREDICTIONS

- New manufacturing alliances will be driven by strong collaborative leadership and will drive foresight knowledge and learning.
- The education bubble will burst, and training will move to technical skills.
- Technology skills will merge with liberal arts education as systems management becomes more important.

2.2 CATALYTIC AND DISRUPTIVE TECHNOLOGIES

The Next Industrial Revolution has brought a dramatic increase in technological advances, some of which are both catalytic and disruptive to transformations taking place. The merging of the digital (IT) and physical (OT) technologies has resulted in smarter products and processes emerging from n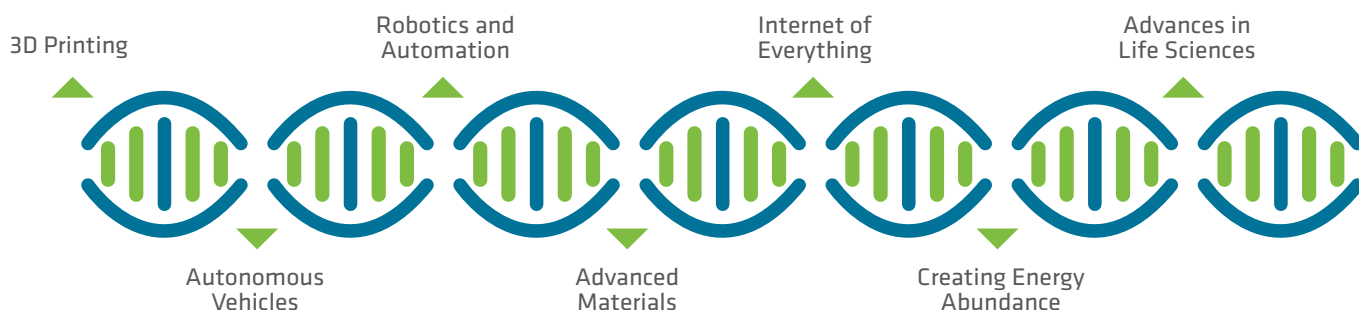ew combinations of advanced hardware and software, sensors, and massive amounts of data and analytics. (1. Advanced Technologies Initiative: Manufacturing and Innovation, Deloitte Global and US Council on Competitiveness, 2015.) Think-Tank participants saw the potential for a serious divergence of tech capabilities - between the haves and the have nots – as well as those unwilling to value data or adopt new technologies. These differences are magnified when comparing connectivity in rural and urban areas, putting some communities at a distinct disadvantage. Overall, participants saw these trends as helpful to people, both in enabling people to live longer and healthier lives, and by contributing to workplace conditions that enable greater work/life balance.

Emerging Catalytic Technologies

3D Printing	Robotics and Automation		Internet of Everything		Advances in Life Sciences
	Autonomous Vehicles	Advanced Materials		Creating Energy Abundance	

Source: Adopted from: Advanced Technologies Initiative: Manufacturing and Innovation, Deloitte Global and US Council on Competitiveness, 2015.

Potential impacts of these trends on industry in the New North region out to 2030:

- Inaction will result in region becoming a digital rust belt.
- Communities will hollow out if industry fails, and people leave for jobs elsewhere.
- Action requires leveraging natural resources and quality of life to get more than our fair share.
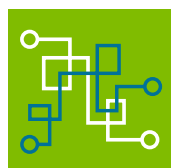
FUTURE PREDICTIONS

- Apathy may lead to inadequate 'sense of urgency' and will cause the region to be beat by other competitor regions.
- Wisconsin could become a leader in rural engagement, focusing on digital connectivity.

Future**Insight**

2.3   CYBERSECURITY REQUIREMENTS AND COMPLIANCE

The global nature of the internet of things has placed cybersecurity at the forefront of security issues everywhere. Many companies are redirecting investments into cybersecurity to enable compliance, and this often has the effect of diminishing innovation due to the concentration on protecting data. The increasing vulnerability of businesses due to their inter-connectivity of organizations and technology was considered a key trend by Think-Tank participants. This growing trend requires the development of defensive products that further deplete organizational resources that could be used for product development or services.

Adopted From: http://icc.mtu.edu/cps/

Potential impacts of these trends on industry in the New North region out to 2030:

- Cybersecurity governance will be totally centralized.
- The United States will experience a reduced competitive position in the global economy.
- Small businesses will drop off due to a lack of resources and their inability to be compliant.
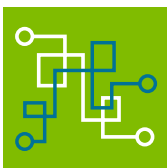
FUTURE PREDICTIONS

- The New North will seize the opportunity to innovate (e.g. invest the resources for small business).
- Government will attempt to intervene in cybersecurity requirements via legislation and regulation.

Future**Insight**
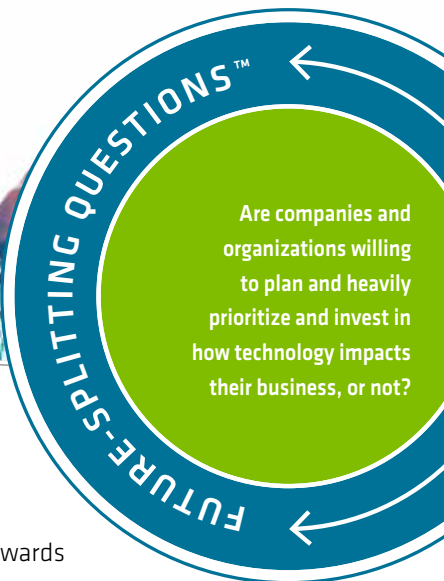
2.4 COMPANY AND ORGANIZATIONAL ORIENTATION TOWARDS TECHNOLOGY

Think-Tank participants discussed the importance of company and organizational orientation towards technology and noted that many do not fully understand the implications for future business. Many businesses are investing without understanding of the application of new technologies. By 2020, it is estimated that there will be 25 and 100 billion objects connected to the Internet of Things (IoT), (UK Government, 2014. The Internet of Things: Making the most of the Second digital Revolution – A report by the UK Government). Emerging trends indicate that larger investments in technology such as artificial intelligence, robotics and virtual reality are needed for businesses to compete in growing global markets.

Company Digitization in the Next 5 Years

	Level of Digitization Today		Level of Digitization in Five Years
AMERICAS	32%	+42%	74%
ASIA PACIFIC	36%	+31%	67%
EUROPE, MIDDLE EAST & AFRICA	30%	+41%	72%

SOURCE: 2016 Global Industry 4.0 Survey. 2016 Pricewaterhouse Coopers LLP

Potential impacts of these trends on industry in the New North region out to 2030:

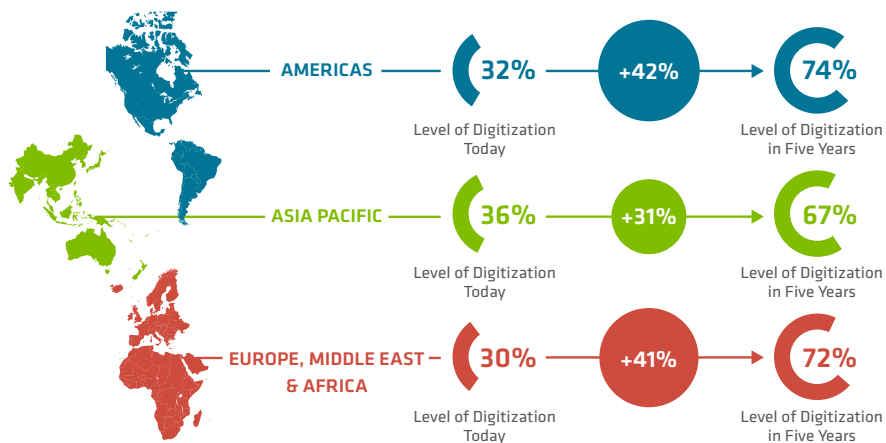- Companies need to approach technology with a mindset that they will be creating new positions that may not currently exist.
- The workforce needs to be ready for what's coming in the future.
- Companies may not exist if they don't have talent/tech savvy employees.
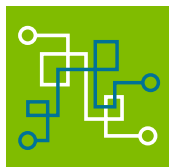
FUTURE PREDICTIONS

- How a company is oriented to technology will create an environment of haves and have nots. Some companies will survive, and others won't.
- If New North businesses have a focus on technology, it could become to be seen as a leader in the state.

Future**Insight**

FUTURE-SPLITTING QUESTIONS ™

Do we maintain our identity
as a manufacturing and
supply chain hub, or do
we lose our relevance
in this segment?

2.5   CHANGES IN SUPPLY CHAINS AND CONSUMERS / CLIENT DEMANDS

Industry 4.0 will drive visibility to the supply chain in real time. These supply chains will become increasingly global in nature with more outsourcing of purchasing. The online presence of consumers will provide tech-connected greater ease of purchasing and securing supply chains world-wide. However, tariff-wars may significantly disrupt supply chains in the short and medium term.

Global Middle Class Consumer Spending

MIDDLE CLASS CONSUMER SPENDING
OUTER RING: 2030 IN TRILLIONS, USD
INNER RING: 2009 IN TRILLIONS, USD

$11.1

ASIA PACIFIC
$32.9

$5.6

EUROPE
$8.1

+571% GROWTH
While increasing Chinese spending tops the
news, the East Asia Bureau of Economic Research
forecasts that spending in India and Indonesia will
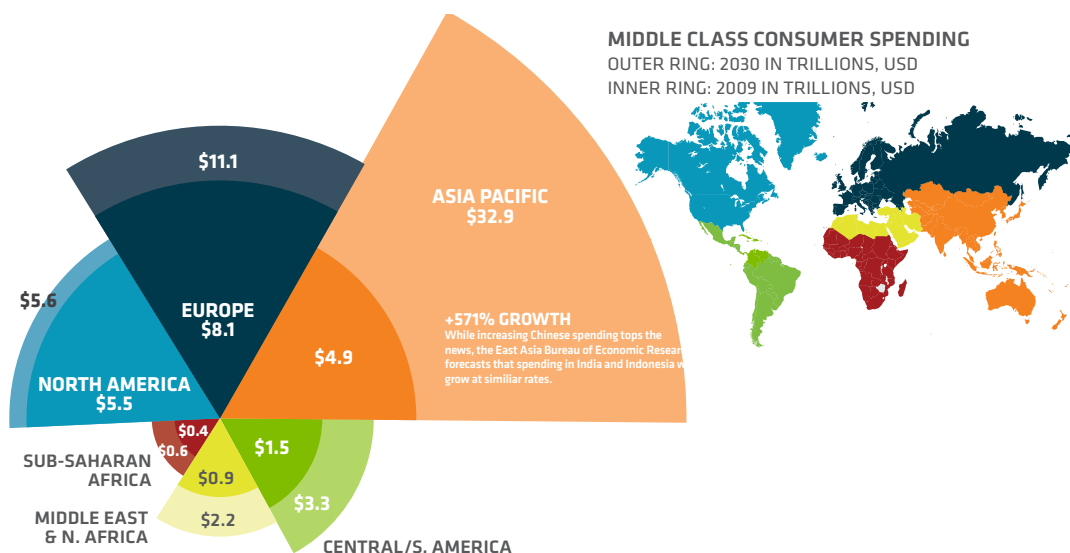grow at similiar rates.

$4.9

NORTH AMERICA
$5.5

$0.4
$0.6

$1.5

SUB-SAHARAN
AFRICA

$0.9

MIDDLE EAST
& N. AFRICA

$2.2

$3.3

CENTRAL/S. AMERICA

SOURCE: L. Kou, 2013. The world's middle class will number 5 billion by 2030. Quartz. Figures based on OECD, 2012. An emerging middle class.

Potential impacts of these trends on industry in the New North region out to 2030:

- New North is not advanced enough to bring industries to the region.
- New North companies will need to increase internal technological applications to integrate with the supply chain.
- The future could go two ways: Potential loss of identity, or, changes could also provide opportunity for organizations to grow.
- These changes will create a need for enhanced partnerships among organizations.
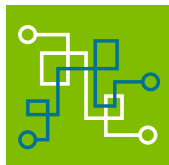
FUTURE PREDICTIONS

- Manufacturers that fail to automate will be in trouble.
- Collaborations in the supply chain will emerge – possibility of forming purchasing cooperatives.

FutureInsight

2.6   IMPACT OF INTERNET OF THINGS AND MASS CONNECTIVITY

There will be increases in connectivity and digitalization of mundane (i.e. household products), driven by an increasing pace of change with tech and innovation. This could lead to an increasing gap in urban/rural; and elsewhere vs. New North, regarding infrastructure, adoption, and skilling. There is potential that the IoT will move so fast, leaving an education system behind what can't keep up.

The Internet of Everything

Factory Performance
- Maintenance
- Production Timing and Changeover

Connected Machines & People

Logistics Optimization
- Real Time Network Planning
- Shipment Visibilty
- Security

Product Performance
- Quality Assurance
- Future Design Improvements

Energy Use Optimization
- Smart Grid
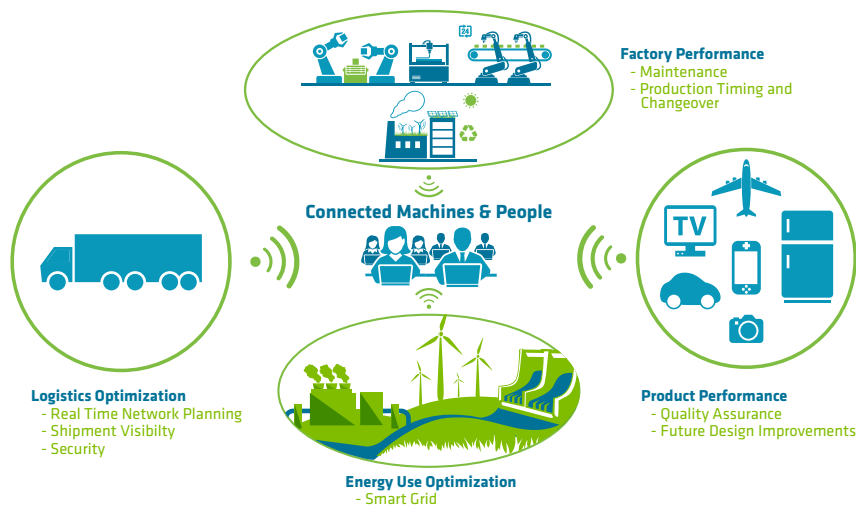
Potential impacts of these trends on industry in the New North region out to 2030:

- Businesses needs to keep current or become irrelevant and enter economic decline (think steel workers).
- Lack of connectivity leads to an inability to educate workforce.
- Decision makers are slower to adopt technology than incoming workforce.
- Technology will enable more flexible work, allowing for attraction of more employees.
- New North has unlimited opportunity in manufacturing and agriculture.
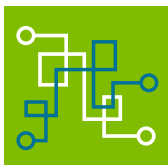
FUTURE PREDICTIONS

- Politics will play a role in adoption, security, privacy.
- Prioritization of funds will determine success or failure.
- Small organizations will be better able to accelerate growth with technology.

FutureInsight

At what point should we delineate between humans and technology - What is the financial or social cost of increasing reliance on AI/predictive analytics?

2.7 ARTIFICIAL INTELLIGENCE AND PREDICTIVE ANALYTICS

AI and predictive analytics will drive most aspects of life. Big data will increasingly influence people via social media and impact areas such as healthcare, consumer behaviors, and criminal justice. There are potential issues of bias in the analysis/predictions and privacy concerns, which can drive communities apart and reinforce differences. There will be an emergence of an expectation that all things will become personalized.

The Increasing Capability of Digital Technologies
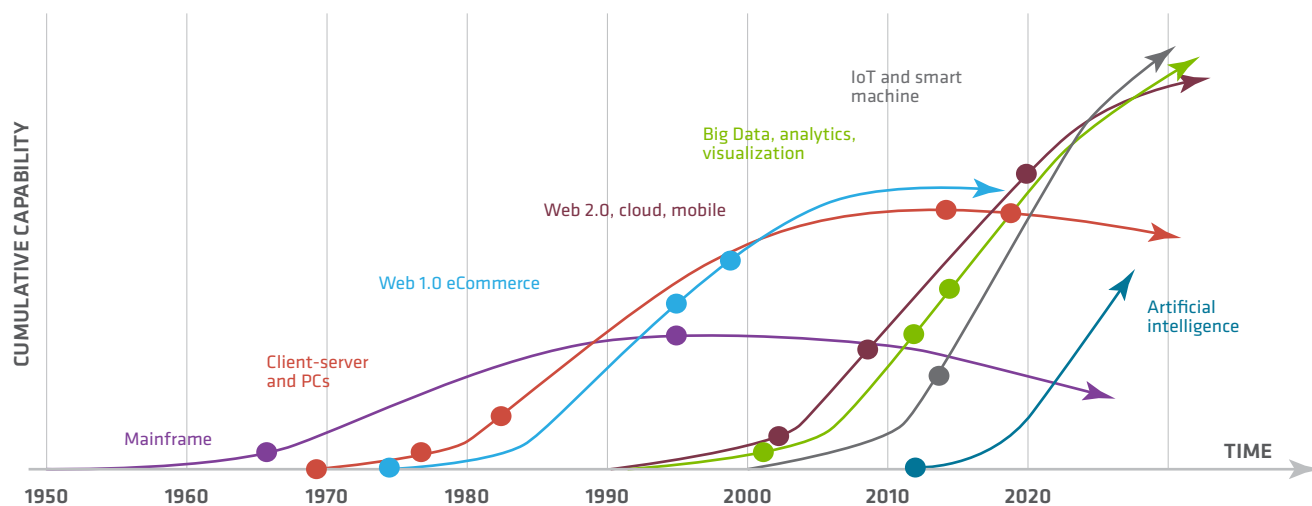
Source: Digital Transformation Initiative Mining and Metals Industry. White Paper, World Economic Forum / Accenture analysis, January 2017.

Potential impacts of these trends on industry in the New North region out to 2030:

- Impacts will occur in the service industry. Services such as telemarking and help desks will be obsolete.
- The education system will need to evolve to prepare workers with AI/per prediction analytics.
- Civic infrastructure will change based on who gets to choose which predicted behaviors are most desirable for a community.
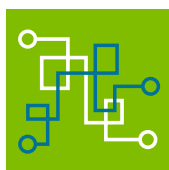
FUTURE PREDICTIONS

- The concepts of privacy and independence will change.
- Our ability to make decisions will be questioned.
- At this pace of dramatic change, it will be necessary to teach and learn at the same time.

FutureInsight

Will we adapt/adopt the appropriate models across disciplines to anticipate and implement solutions at the speed of A & R innovations and needs?

FUTURE-SPLITTING QUESTIONS ™

2.8   AUTOMATION AND ROBOTICS

Automation and robotics will drive much greater integration of the manufacturing process. There are significant issues associated with this driver, including workforce changes and affordability of adoption. Challenges that this driver brings includes the need for radically new education and training for the workforce, and the technical hurdle for companies to adopt this technology.

Predicted Aspects of Robotic Improvement and Innovations

MODULAR
Adaptable configurations that can be changed based on application

COMPACT AND LIGHTWEIGHT
Smaller footprint required on the shop floor and easily redeployed

FAST
Advances in electronics and motors have led to quicker robots

COLLABORATIVE
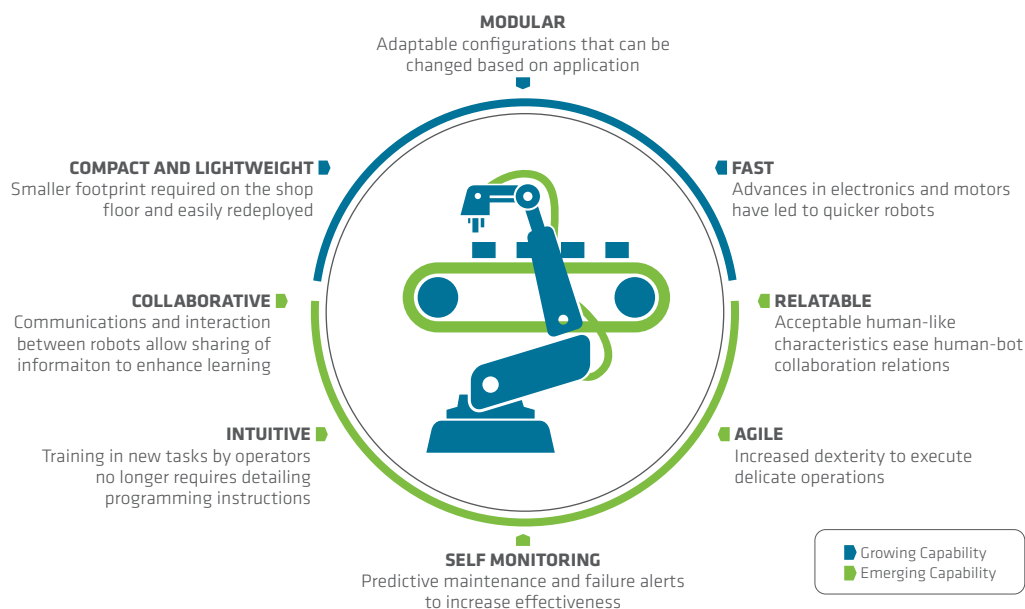Communications and interaction between robots allow sharing of informaiton to enhance learning

RELATABLE
Acceptable human-like characteristics ease human-bot collaboration relations

INTUITIVE
Training in new tasks by operators no longer requires detailing programming instructions

AGILE
Increased dexterity to execute delicate operations

SELF MONITORING
Predictive maintenance and failure alerts to increase effectiveness

■ Growing Capability
■ Emerging Capability

Source: International Federation of Robotics, World Robotics: Industrial Robots 2015.

Potential impacts of these trends on industry in the New North region out to 2030:

- Education will partner with the private sector to build automation into education.
- New tools and resources that reflect true business needs and goals will emerge.
- Leadership models keep up with rate of change.
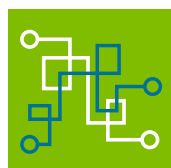
FUTURE PREDICTIONS

- Businesses will choose to close, relocate or integrate.
- There will continue to be enhanced and responsive partnerships.
- Success will be tied to the region's willingness to learn and adapt to automation and robots.

Future**Insight**

FUTURE-SPLITTING QUESTIONS ™

Do we choose to proactively reduce our uncertainty, or do we wait for others to reduce it for us? Do we individually approach this or collaborate?

2.9   ADDITIVE MANUFACTURING

Think-Tank participants anticipate that additive manufacturing will open the door to on demand/consumerization of Business-to-Business functions in the region. With the worldwide 3-D printing industry expected to exceed $21 billion in worldwide revenue by 2020, (Wohlers Associates, Wohlers Report 2014), the New North stands to benefit greatly by embracing this element of manufacturing in area businesses. Of particular interest to Think-Tank participants was the potential to develop the areas of miniaturization and material sciences as part of future planning. Additive manufacturing was also seen as a step towards reducing carbon emissions.

3D printing is accelerating in efficiency

50% cheaper & 400% Faster in the next 5 Years

Prototyping → Mass Production
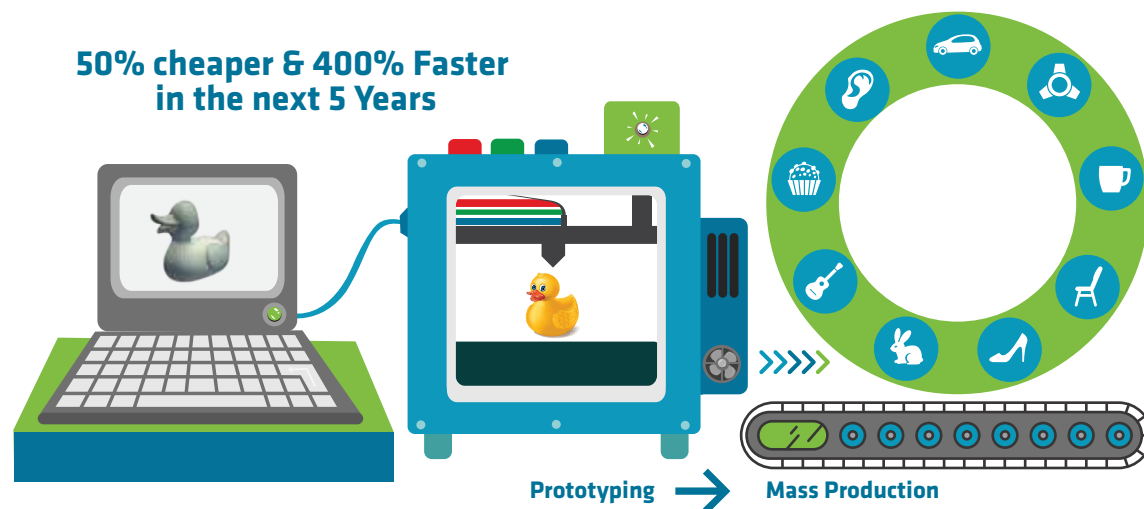
Source: Siemens, 3-D Printing: Facts and Forecast, 2016.

Potential impacts of these trends on industry in the New North region out to 2030

- Additive manufacturing will create different cargo for transport (e.g. Raw feedstocks change to printing materials).
- Different business models will emerge.
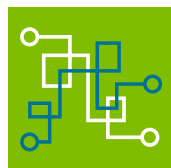
FUTURE PREDICTIONS

- There will be increased shared vertical research and development funds, collaboratives, capabilities and cooperatives.
- Additive manufacturing will significantly improve digital infrastructure.

FutureInsight

Can we invest enough and fast enough in the right priorities to stay competitive in an exponential world?

FUTURE-SPLITTING QUESTIONS™

2.10   MATERIAL SCIENCE AND PRODUCT INNOVATION

Material science and product innovation is a key part of the Industry 4.0 revolution. This will help drive new products that focus on sustainability, in areas including energy, biofriendly plastics, and natural products. Trends in nanotech help create new materials with unique properties. This will help drive large scale product customization and personalization.

AI will help drive atomically precise manufacturing. Product innovation will also be spurred by the challenge of feeding 10 billion people on the planet.

Technology Adoption Lifecycle

"The Chasm"

Area under curve represents market share

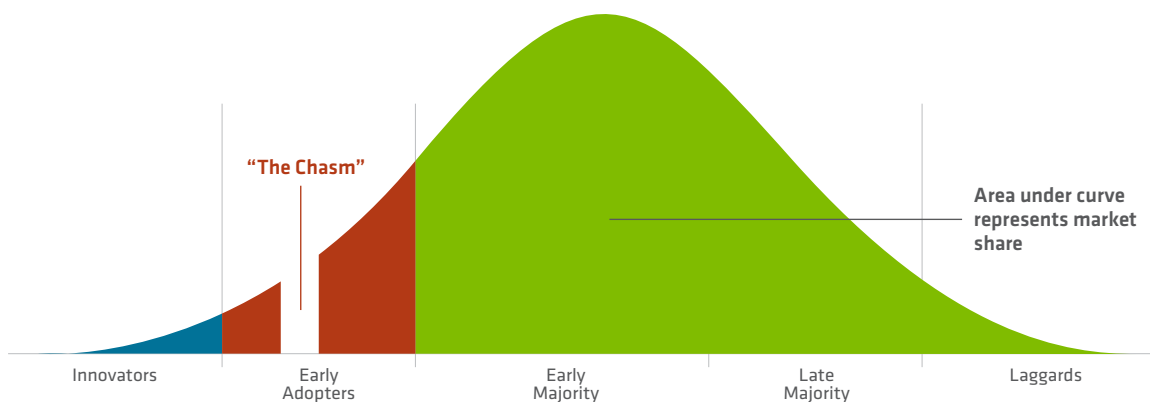| Innovators | Early Adopters | Early Majority | Late Majority | Laggards |

Source: Geoffrey Moore, Technology Adoption Lifecycle in Crossing the Chasm, 2006.

Potential impacts of these trends on industry in the New North region out to 2030:

- Paper beats plastic – replacing synthetic with naturals.
- Modernization of infrastructure will occur with an infusion of capital.
- There will be a 21st century education and mindset revolution/renewal.
- Small farmers can capitalize on Farm to Table as needs to adapt to a digital transformation.
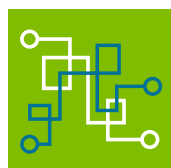
FutureInsight

FUTURE PREDICTIONS

- There will be more natural/bio-based products than synthetic products; paper replaces plastic.
- Agriculture will be more efficient; Farm to Table reduces waste by 50%
- Education will be more entrepreneurial and 'Just-in-Time'.
- A New Wisconsin is no longer a 'fly over state' but is the 'start-up capital of the Midwest.' To do this we need New North to identify the 'vital few priorities' vs. the 'trivial many'.

Is the up-and-coming
next generation of
leadership prepared for
sudden disruptions and
speed of change?

FUTURE-SPLITTING QUESTIONS™

3.0   WORKFORCE AND WORKPLACE

3.1   LEADERSHIP AND MANAGEMENT STYLES AND NEEDS

Currently, most business leaders are 'Baby boomers' and are trying figure out how to bridge the generation gap and create relevant workplaces for the 'up and coming' generations. There is a changing relationship with technology and accelerating technology adoption rates, and more team leadership roles. There is a challenge where some workplaces are leaning on technology and hence losing face to face personal and communication skills.

Nature of work is changing, driven by automation and robotics

Technical feasibility, % of time spent on activities that can be automated by adapting currently demonstrated technology.

Time spent in US occupations, %

Source: Where Machines can replace humans - and where they can't by Michael Chui, James Manyiko, and Mehdi Miremadi, McKinsley Quarterly 2016

Potential impacts of these trends on industry in New North region out to 2030:

- Lose potential leaders if we don't train middle management in leadership skills.
- Technology applications for more on-line face to face.
- Need for more understanding of digital transition on their businesses.
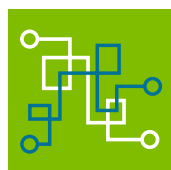
FUTURE PREDICTIONS

- More remote management and platforms such as video conferencing.
- More seamless relationships between supplier/buyer ecosystem partnerships.
- Leadership styles will need to change as nature of workforce changes.

Future**Insight**

FUTURE-SPLITTING QUESTIONS™

Will schools and industry collaborate with one another to develop a career centric educational system for students, or not prepare students for their future work?
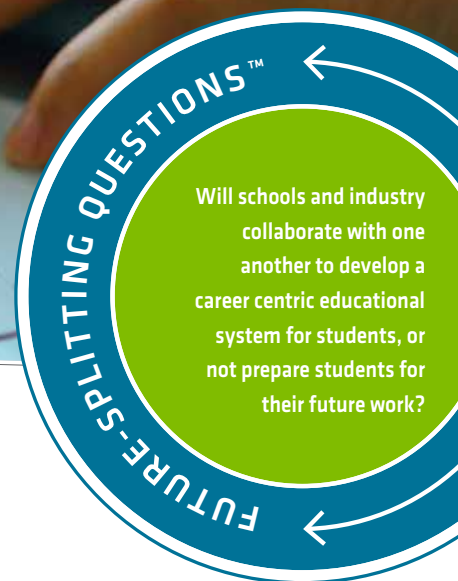
3.2 ROLE OF EDUCATION SYSTEMS IN TRAINING AND RETRAINING

Key emergent high-level trends:

- Awareness of multiple pathways: tech college, 4-year, certificate

- Need for more opportunities

- Flexible learning Academic and Career Pathway (ACP) – other channels then traditional college

- Need for employability skills specifically taught and measured in K-20 as a focus employers are requesting

- Change in philosophy in teaching not congruent with the workforce (attendance)

Source: Advanced Technology Initiative, Deloitte and the Council on Competitiveness

Potential impacts of these trends on industry in New North region out to 2030:

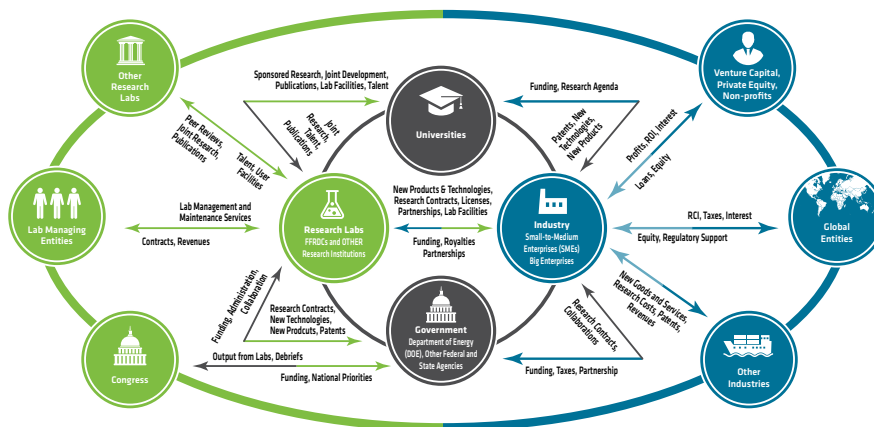- Employability skills instruction and measures impact will result in the development of better skilled future employees.

- ACP will give students a better chance at making better decisions in their future career and less college debt.

- Delivery of education more online, more college credits in high school.

- Greater alignment between schools and industry.

- Broad adoption of apprenticeships and no longer working in silos.
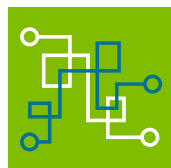
FUTURE PREDICTIONS

- More industry engaged with students' career awareness.

- More companies will be hiring students right out of high school due to fewer numbers of working populations.

- Body and skills gap will provide more opportunities for underemployed.

FutureInsight

Are we adjusting our culture to support incoming / future workforce / while maintaining Baby Boomer workforce?

FUTURE-SPLITTING QUESTIONS ™
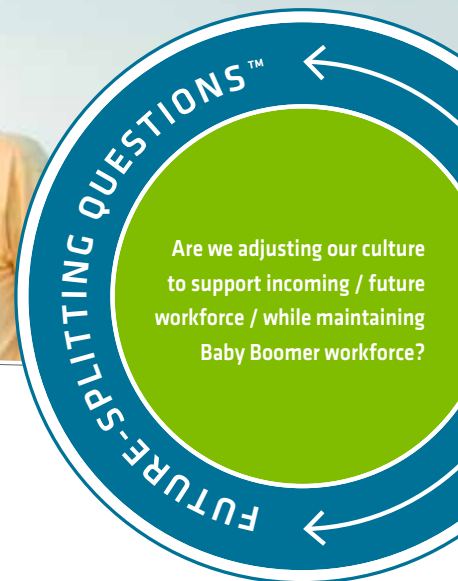
3.3 DEMOGRAPHIC TRANSITION (BABY-BOOMER TO MILLENNIALS)

Key emergent high-level trends:

- Boomers are moving out of workforce; need to develop workforce

- Discussion has now turned into reality and continues to happen

- Competing value systems between generations

- Need to focus on generations for workforce development

- People living longer and willing to participate in workforce

- Immigration changes needed

Changing workforce generational profile
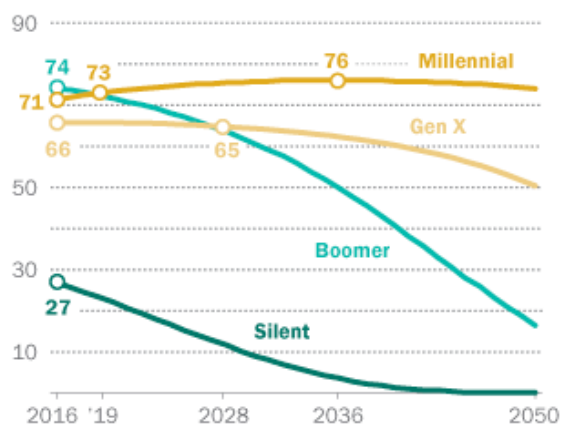
Reference Note: Millennials refer to the population ages 20 to 35 as of 2016.

SOURCE: Pew research Center tabulations of U.S. Census Bureau population projections released December 2014 and 2016 population estimates.

Potential impacts of these trends on industry in New North projections out to 2030:

- Tech comfort differences between generations.

- Labor intensive industries will be challenged by not finding hard labor done by Baby Boomers, i.e. foundries, farming, meat packing.
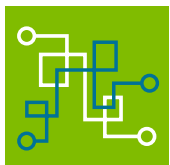
FUTURE PREDICTIONS

- We will see increased workforce diversity and younger leadership of companies.

- Automation will accelerate to fill workforce gaps.

- Succession planning is a critical need for most companies, and we may even see a contraction in business due to inability to transition to new ownership.

FutureInsight

FUTURE-SPLITTING QUESTIONS ™

What would a regional (New North) housing collaboration look like to address needs and disparities in affordable housing?

3.4   WORKFORCE HOUSING ACCESS AND AVAILABILITY

Key emergent high-level trends:

- New North communities, esp. rural with surplus of Baby Boomer homes – not attracting workers
- Popular communities are increasingly challenged to provide affordable housing
- Increasing difference between communities that are desirable to young workers and those that are not
- Younger generations less interested in home ownership
- Community leadership and planning is a mark of success

Potential impacts of these trends on industry in New North region out to 2030:

- Growth of disparity between popular communities and ones left behind.
- Increased demand for non-single-family homes.
- Construction sector will struggle to meet demand due to lack of workers.
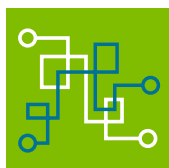
FUTURE PREDICTIONS

- This gets worse before it gets better.
- The construction industry will struggle to find workers.

Future**Insight**

Will we level-up our wages and creative workplace incentives or will we maintain the status quo?

FUTURE-SPLITTING QUESTIONS ™

3.5   WAGE LEVELS AND WORKPLACE INCENTIVES

Key emergent high-level trends:

- Wage inequality – wages increasing at the top, but hollowing out of the middle – macro trend
- Generations are working for different workplace incentives
- Access that employees have for information is increasing – asking for more
- Incentives are becoming less monetary in nature (time, workplace flexibility, etc.)
- Wages are going up – competition is increasing for employees
- Organizations are improving physical infrastructure and cultural infrastructure to become an employer of choice

The changing workplace – driven by disruption from technology

STAGE 1:
Sharing Economy Platforms
The Gig Economy

- Nonemployee freelance workers
- Temporary assignments

40%
of US workers independent contractors by 2020

STAGE 2:
Artificial Intelligence and Robotics
The Machine Economy

- Massive labor disruption
- Human labor displaced and supplemented
- Jobs unbundled into tasks

40%
White collar and creative work not immune
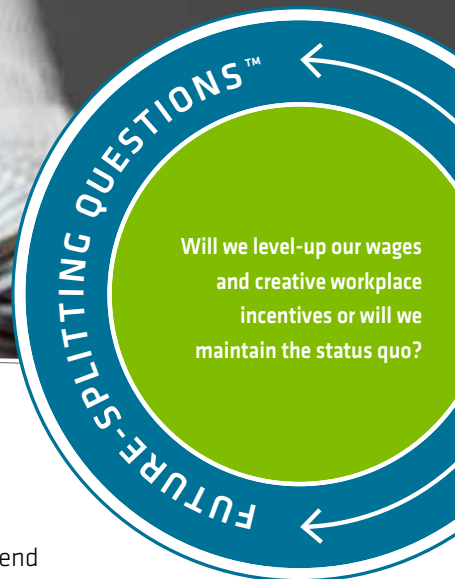
5.1 MILLION
net job loss by 2020

Source: The Upside of Disruption: Megatrends shaping 2016 and beyond. EYQ 2016

Potential impacts of these trends on industry in New North region out to 2030:

- Organizations will need to be able to connect the dots between investment in employees and shareholder value, focusing on Return on Investment (ROI).
- Companies will need to become more innovative in offering workplace incentives in order to compete.
- Rethink staffing models - If there is no investment, talent is going to move away.
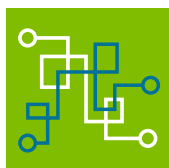
FUTURE PREDICTIONS

- New North organizations are improving physical and cultural infrastructure to become a region of choice.
- Businesses and communities are collaborating to help attract and retain talent – expectation of more involvement and engagement.

Future**Insight**

How do we disrupt the current learning system and thinking to foster the needed relevant collaboration of functions/technical and interpersonal skills?

FUTURE-SPLITTING QUESTIONS™
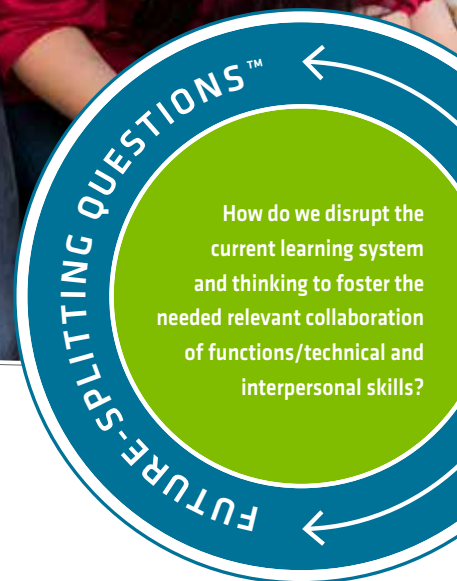
3.6   CHANGING SKILLSET NEEDS

Key emergent high-level trends:

- Need mass connectivity to aid info-sharing
- Need new behaviors to help people listen, collaborate, interact
- 'Decay time' of knowledge is accelerating, meaning that knowledge and skills have the potential to become obsolete faster. The means the educational system will need to adapt with faster curriculum development.
- Need Just in Time (JIT) training
- The brain structure of our children is changing – Younger generations learn in snippets
- How do we teach a generation that has a different way of leaning than the teachers?

Most important skills for Industry 4.0 compared with today[1]

Change in skill importance

Skill	Industry 4.0	Change
Reading Comprehension		+20%
Critical Thinking		+18%
Active Listening		+16%
Speaking		+15%
Complex Problem Solving		+26%
Judgment & Decision Making		+24%
Writing		+26%
Time Management	Only skill that is not an "adaptive skill"	+13%
Monitoring		+4%
Active Learning		+32%

Avg. increase of 20% in Skill Importance

30 40 50 60 70 Average skill importance rating, 0 - 100

Adaptive Skills Expected to be ~20% More Critical across Top Industry 4.0 Jobs than they are in Manufacturing today
Source: Advanced Robotics for Manufacturing, Pittsburg 2017.

Potential impacts of these trends on industry in New North region out to 2030:

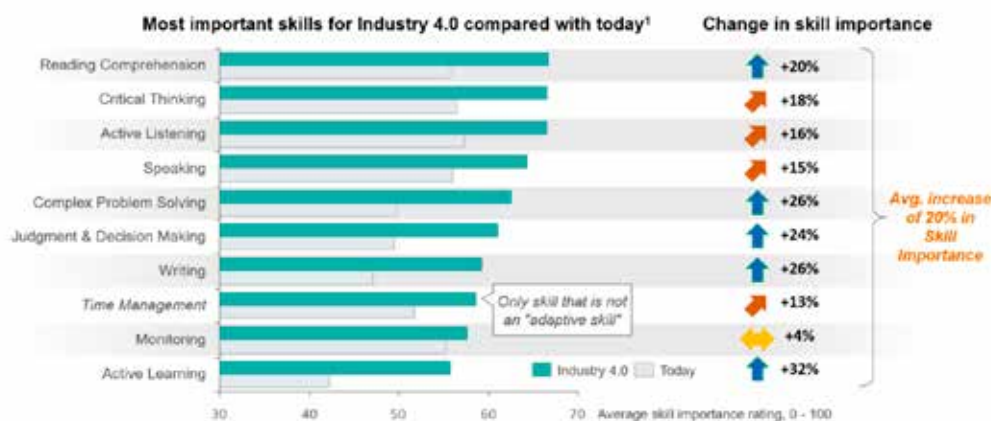- There is always a tension between technical and interpersonal skills – How to balance the issue of social isolation? How do we aid and foster self-awareness and critical thinking?
- What happens if we don't address psycho-social needs (e.g. loneliness).
- There is a false choice of personal vs. technical skills.
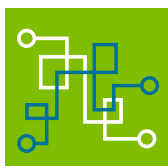
FUTURE PREDICTIONS

- A third of our current education systems will be gone because they won't meet the market need.
- Our most forward-looking people may go outside of the region to find what they need in career, education and life.
- We need to prepare our talent in the education system to meet the needs of tomorrow.
- The isolation that technology can create will drive / affect personal individual psycho-social needs. What role can we play in fostering self-actualities?

FutureInsight

FUTURE-SPLITTING QUESTIONS™

What does inclusion and equity look like at every level/every aspect of our regional culture? Are the Fox Cites as inclusive as white residents think?

3.7 WOMEN IN THE WORKFORCE AND CULTURAL INCLUSIVITY

Key emergent high-level trends:

- Emerging conversation about the importance of gender / racial diversity / lack of representation at higher levels of leadership
- A national reconciliation of racism / sexism in our social fabric
- 'Willful blindness' on the part of white men / endemic apathy
- Social conformity / upper midwestern culture

Share of Total Employment, Science and Engineering Degrees, and Stem Employment by Sex
(In percent, Data based on sample. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see www.census.gov/acs/www/)
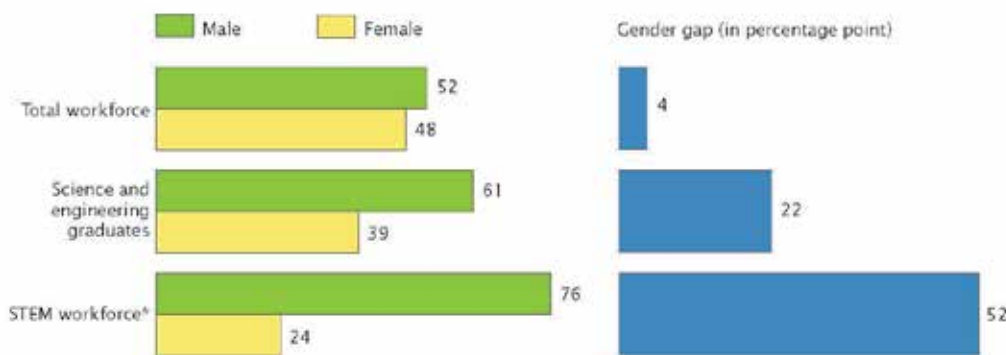
With a science or engineering bachelor's degree
Source: U.S> Census Bureau, 2011 American Community Survey.

Potential impacts of these trends on industry in New North region out to 2030:

- Recruiting, hiring, training, retaining, and growing women's profile in all workforces and especially in STEM occupations.
- Additional approaches in building talent pools and leadership capacity will be fully embraced, to help increase retention of talent.
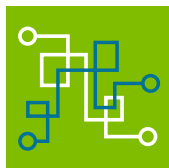
FUTURE PREDICTIONS

- Racial demographics for young Wisconsinites are much more diverse.
- Fox Cities is a region that can embrace diversity, model inclusion and maintain equality to ensure shared prosperity for all.

FutureInsight

FUTURE-SPLITTING QUESTIONS™

What is our willingness to redefine work / work ethic and redefine the constructs within the workplace? Should we define work in terms of time or productivity?
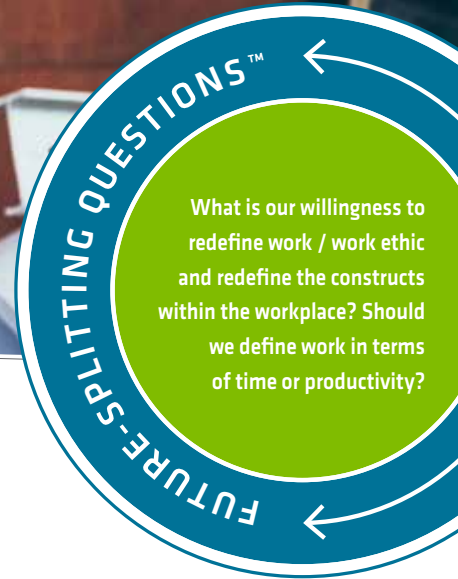
3.8 CHANGING SOCIETAL VALUES AND IMPACT ON WORK ETHIC

Key emergent high-level trends:

- Idea of 'place' of work – virtual vs. in-person

- Flexible workplaces and schedules

- Structural scoring / gamification of 'work task' projects / more project management activity

- On-the job engagement – sufficient workloads

- Work/life balance – focus on health vs. sedentary

- Additional comments: Lack of trust – are you working?

Drivers of Change - Survey Results (2016) of Chief HR and Strategy Officers of Leading Global Employers
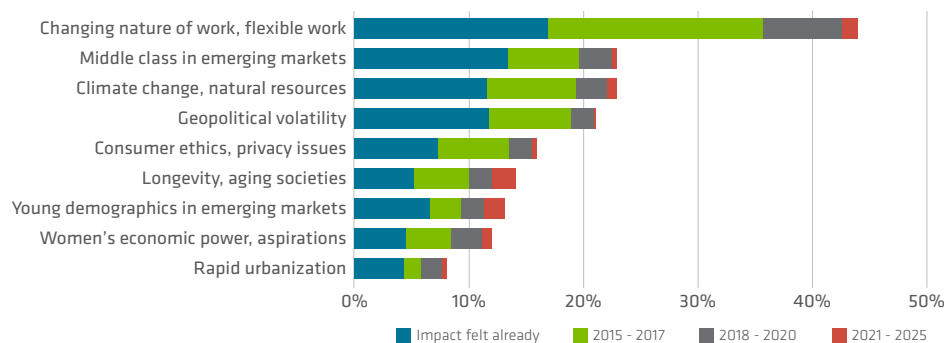
Source: The Future of Jobs: Employment, Skills, and Workforce Strategy for the Fourth Industrial Revolution. World Economic Forum 2016.

Potential impacts of these trends on industry in New North region out to 2030:

- Expand workforce – could have more access to more talent if off-site.

- Shared workforces (if don't have sufficient workloads).

- Need shifts in leadership mindset / shifting constituents of what a 'productive' worker looks like.

- Work culture for competitive edge – more investment in flexible work environment.

- Ability to collaborate across sites / international.
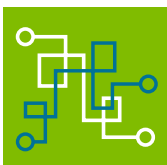
FUTURE PREDICTIONS

- As 'traditional mindsets' leadership transitions, natural adoption of emerging work ethic trends.

- If you adopt faster, you'll be more competitive.

- Job descriptions and enforcement of that will change.

FutureInsight

Will we take action on appropriate immigration policy proactively, or we will we wait until absolute crisis? Are we already at absolute crisis?

3.9   POLITICAL IMPACTS – SKILLED IMMIGRATION POLICY

Key emergent high-level trends:

- Dramatic polarization reinforced by political structure
- Demographics – mismatch between needs and trends, bottleneck for adapting
- Melting pot vs. Salad bowl

Unemployment Dips to 3.7 Percent

CIVILIAN UNEMPLOYMENT RATE

Notes: All values are seasonally adjusted. In the bar chart, figures for the two most recent months are preliminary and may be revised later. Source: Bureau of Labor Statistics, Federal Reserve Bank of St. Louis (unemployment rare, payrolls, wages) Credit: Alyson Hurt/NPR

Potential impacts of these trends on industry in New North region out to 2030:

- Mismatch between need and worker, bottleneck for adapting.
- Lost opportunities – people exit country, next generation doesn't upskill.
- Risk at back/forth between polarizing policy change/lack of change.
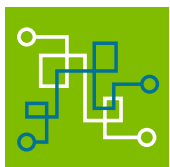
FUTURE PREDICTIONS

- Could be an early adopter if we hit the 'bottom' or crisis first.
- Positions of influence embrace and plan forward to change trajectory.
- Responsiveness, agility, rate of change critical because this is competitive region to region.

FutureInsight

Will employers develop the necessary workplace models that will attract the Gig economy?

3.10   EVOLVING WORKPLACE MODELS

(COMPANY CULTURE, JOB SHARING, REMOTE WORK, FLEXIBLE WORK HOURS)

Key emergent high-level trends:

- Company culture working to understand the needs of younger generations
- Transparency to how the organizations are doing business
- Evolving education and training within companies – internal university
- Micro credentialing
- Catering to the workplace – creative ways to keep employees satisfied. Benefits and on-site day care, remote work, stand up desks
- Additional comments: The gig economy; What is the region doing to be attractive; healthcare benefits essential

Projected (2022) strategies to address shifting skills needs, by proportion of companies (%)

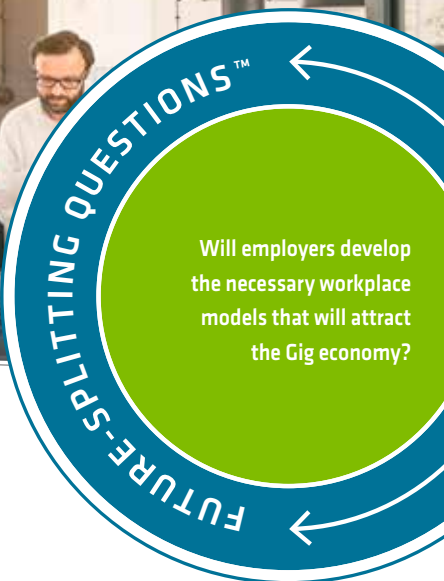|	Likely	Equally likely	Unlikely
Hire new permanent staff with skills relevant to new technologies	84	12	
Look to automate the work	81	14	
Retrain existing employees	72	23	
Expect existing employees to pick up skills on the job	65	22	
Outsource some business functions to external contractors	64	26	
Hire new temporary staff with skills relevant to new technologies	61	21	
Hire freelancers with skills relevant to new technologies	54	29	
Strategic redundancies of staff who lack the skills to use new technologies	46	31	

Source: Future of Jobs Survey 2018. World Economic Forum.

Potential impacts of these trends on industry in New North region out to 2030:

- Less employees, more 1099 independent.
- More focus on region of amenities to attract workers more so than employees.
- More acceptance and flexibility for diverse cultures.
- Cyber security trends will change how we do work.
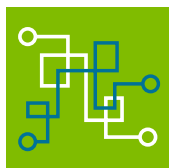
FUTURE PREDICTIONS

- Organizations will be forced to adapt workplace model or be obsolete.
- In 10 years, we will still be 10 years behind.
- We need much more large investments to exponentially evolve.

Future**Insight**

In a world of exponential speed of change and converging technologies, how can human systems evolve fast enough?

FUTURE-SPLITTING QUESTIONS ™

4.0   DRIVER RANKING

Stakeholders were asked to rank each driver against four questions:

1. **POTENTIAL NATURE OF IMPACT**: For each driver, please record your perception of the nature of impact on the New North region and its industries, over the next 5-10 years.   SCALE: -5 = very negative; +5 = very positive.

2. **PREPAREDNESS OF REGION**: For each driver, please record your perception of the preparedness of the New North region and its industries to change over the next 5-10 years.   SCALE: -5 = Not at all prepared; + 5 = Very well prepared.

3. **SIZE OF POTENTIAL IMPACT**: For each driver, please record your perception of the size of potential impact over the next 5-10 years in the New North region and its industries.   SCALE: 1 = Very small impact; 10 = Very large impact.

4. **SPEED OF CHANGE**: For each driver, please record your perception of the speed of change we will experience over the next 5-10 years in the New North region and its industries.   SCALE: 1 = Very slow; 10 = Very fast.

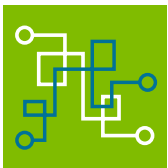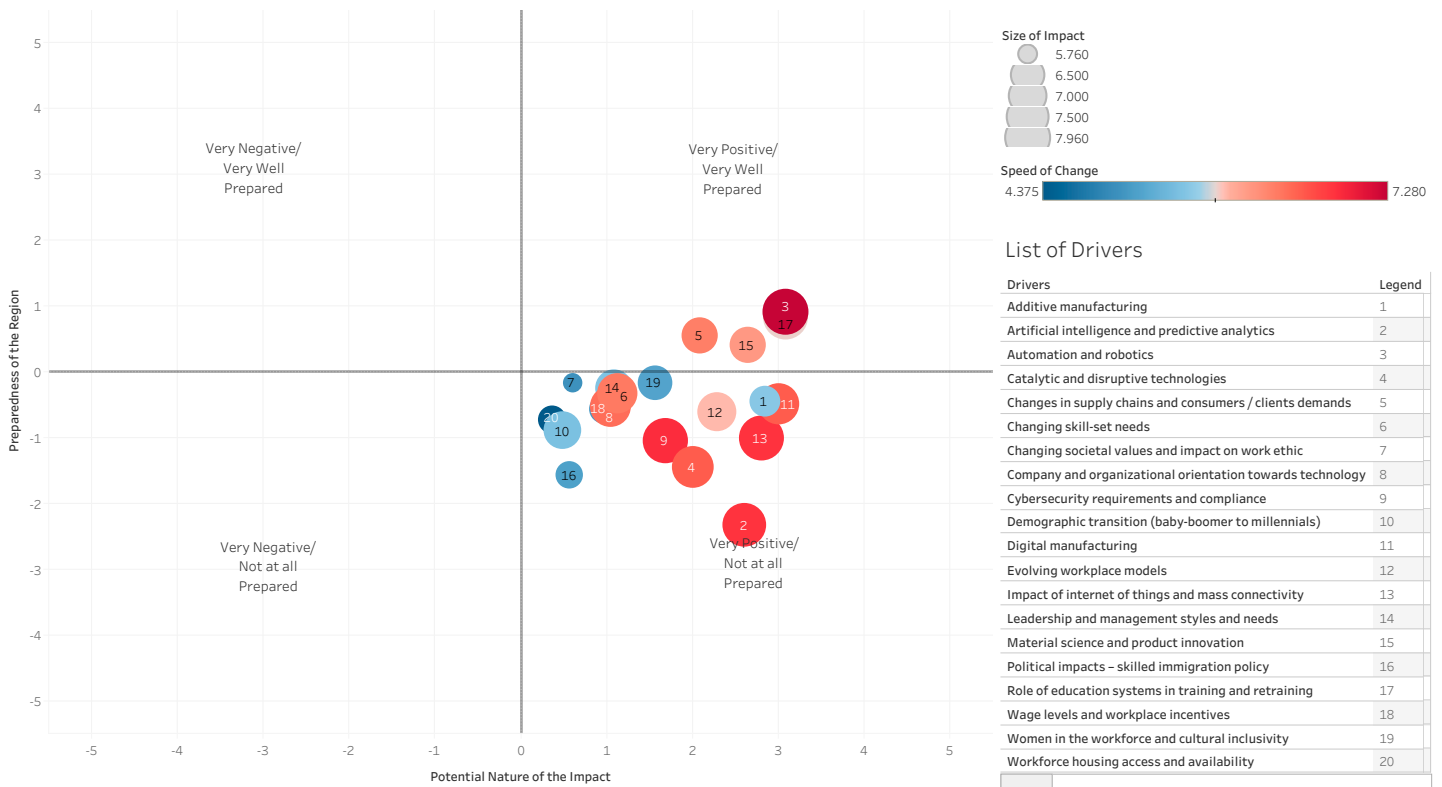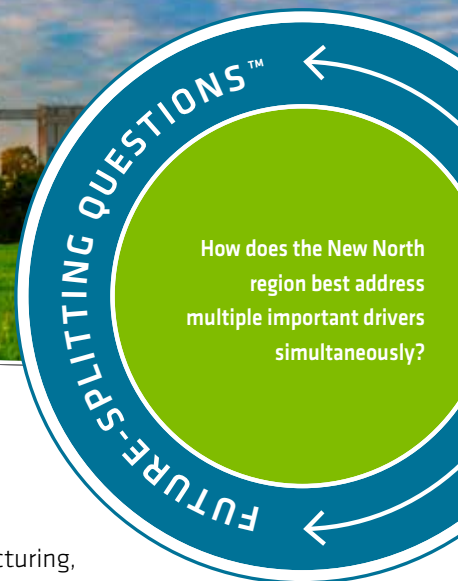Size of Impact
- 5.760
- 6.500
- 7.000
- 7.500
- 7.960

Speed of Change
4.375 — 7.280

List of Drivers

Drivers	Legend
Additive manufacturing	1
Artificial intelligence and predictive analytics	2
Automation and robotics	3
Catalytic and disruptive technologies	4
Changes in supply chains and consumers / clients demands	5
Changing skill-set needs	6
Changing societal values and impact on work ethic	7
Company and organizational orientation towards technology	8
Cybersecurity requirements and compliance	9
Demographic transition (baby-boomer to millennials)	10
Digital manufacturing	11
Evolving workplace models	12
Impact of internet of things and mass connectivity	13
Leadership and management styles and needs	14
Material science and product innovation	15
Political impacts – skilled immigration policy	16
Role of education systems in training and retraining	17
Wage levels and workplace incentives	18
Women in the workforce and cultural inclusivity	19
Workforce housing access and availability	20

FUTURE PREDICTIONS

- Overall, all the drivers were seen on average as having a potential positive impact in the region.

- The speed of change associated with technology drivers as part of Industry 4.0 were perceived to move much faster than the soft system human drivers.

Future**Insight**

How does the New North region best address multiple important drivers simultaneously?
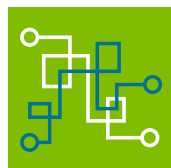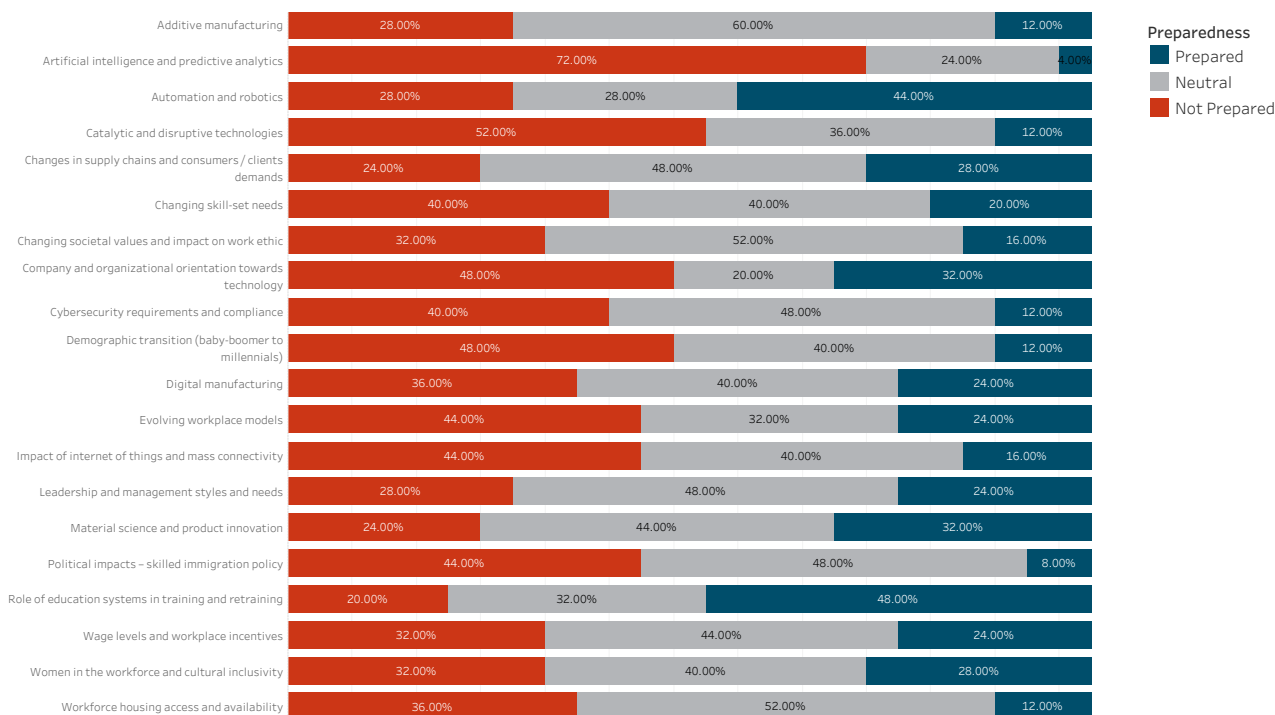
FUTURE-SPLITTING QUESTIONS™

5.0   RECOMMENDED KEY DRIVER TRACKING

Based on the stakeholder assessments, the majority of responses viewed the region as 'Not Prepared' for more of the drivers. The exceptions were drivers associated with Digital Manufacturing, Role of Education and Automation and Robotics.

Given the scale of the challenge and the number of critical drivers, it is recommended that New North develop a Business Intelligence dashboard that tracks the following key drivers:

- **Digital Transformation**: Artificial intelligence, predictive analytics, catalytic and disruptive technologies, and cybersecurity requirements.

- **Workplace and Workforce**: Business understanding and engagement with Industry 4.0, Demographic patterns (especially rate of Baby Boomer retirement), trends in workforce housing, and changing societal values and impacts on work ethic.

Driver	Not Prepared	Neutral	Prepared
Additive manufacturing	28.00%	60.00%	12.00%
Artificial intelligence and predictive analytics	72.00%	24.00%	4.00%
Automation and robotics	28.00%	28.00%	44.00%
Catalytic and disruptive technologies	52.00%	36.00%	12.00%
Changes in supply chains and consumers / clients demands	24.00%	48.00%	28.00%
Changing skill-set needs	40.00%	40.00%	20.00%
Changing societal values and impact on work ethic	32.00%	52.00%	16.00%
Company and organizational orientation towards technology	48.00%	20.00%	32.00%
Cybersecurity requirements and compliance	40.00%	48.00%	12.00%
Demographic transition (baby-boomer to millennials)	48.00%	40.00%	12.00%
Digital manufacturing	36.00%	40.00%	24.00%
Evolving workplace models	44.00%	32.00%	24.00%
Impact of internet of things and mass connectivity	44.00%	40.00%	16.00%
Leadership and management styles and needs	28.00%	48.00%	24.00%
Material science and product innovation	24.00%	44.00%	32.00%
Political impacts – skilled immigration policy	44.00%	48.00%	8.00%
Role of education systems in training and retraining	20.00%	32.00%	48.00%
Wage levels and workplace incentives	32.00%	44.00%	24.00%
Women in the workforce and cultural inclusivity	32.00%	40.00%	28.00%
Workforce housing access and availability	36.00%	52.00%	12.00%

Preparedness
■ Prepared
■ Neutral
■ Not Prepared

FUTURE PREDICTIONS

- The region was seen as being best prepared for 'Role of education systems in training and retraining' and least prepared for 'Artificial intelligence and predictive analytics'.

- The challenge for businesses in the New North region will be to adapt fast enough to both societal trends and technology trends.

FutureInsight

6.0 ACKNOWLEDGEMENTS

New North stakeholders who engaged in the key driver's discussions included:

Tom Baron, East Central WI RPC

Becky Bartoszek, Fox Cities Chamber of Commerce

Joe Bashta, Axicor Analytics

Kelli Bischoff, KB & Associates

Oliver Buechse, My Strategy Source

Dennis Buehler, Greater Green Bay Community Foundation

George Bureau, Wisconsin Manufacturing Extension Partnership

Naletta Burr, Wisconsin Economic Development Corporation

Edward Byrne, Zander Pess Inc., The Billion New

Matthew Christman, The New North

Scott Clark, The Boldt Company

Lynn Coriano, POINT/Basic Needs Giving Partnership

Pete Dulcamara, Kimberly-Clark

John Ernst, Kinnektor

Timothy Feldhausen, Davis & Kuelthau, s.c.

Ann Franz, NEW Manufacturing Alliance

Mary Goggans, Encapsys

Jim Golembeski, Bay Area Workforce Development Board

Jeff Grebinoski, Northeast WI Technical College

Kurt Hahlbeck, Hugo Enterprises

Cecilia Harry, Envision Greater Fond du Lac

Dan Heiser, St. Norbert College, Schneider School of Business & Economics

Anil Hurkadli, Thrivent Foundation

Kim Iversen, NEW IT Alliance

Meridith Jaeger, NWTC

Jerimiah Janssen, First Business Bank

Nicole Kiss, INSPIRE Sheboygan County

Mary Kohrell, Calumet County Economic Development

John Kreul, Amcor

Barb LaMue, New North Inc

Matt Lemke, Investors Community Bank

Connie Loden, New North Inc

Trevor Lord, Hoffman

Maggie Lund, ThedaCare

Dr. Susan May, Fox Valley Technical College

Colleen Merrill, Small Business Development Center at UW Oshkosh

Jerry Murphy, New North Inc

Melissa Nash, Univ of Wisconsin Green Bay

Vernon Peterson, WEC Energy Group

Penny Ransom, Network Health

Donna Rippin, VibeTech Enterprises

Kathryn Rogalski, Northeast Wisconsin Technical College

Tim Schneider, Investors Community Bank

Michelle Schuler, Microsoft

Mark Schwei, Consolidated Construction Co

Irene Strohbeen, Irene Strohbeen & Associates, LLC

David Thiel, Waupaca County Economic Development Corporation

Scott Valitchka, 15 Dots, LLC

Aina Vilumsons, WPI

Mitch Weckop, Skyline

David Wegge, Bay Area Community Council

William Woodward, von Briesen & Roper, s.c.

Ken Zacharias, CLA

7.0   CONTACT INFORMATION

For more information about the New North, and this initiative, please contact:

Connie Coley Loden, Sr. Project Manager
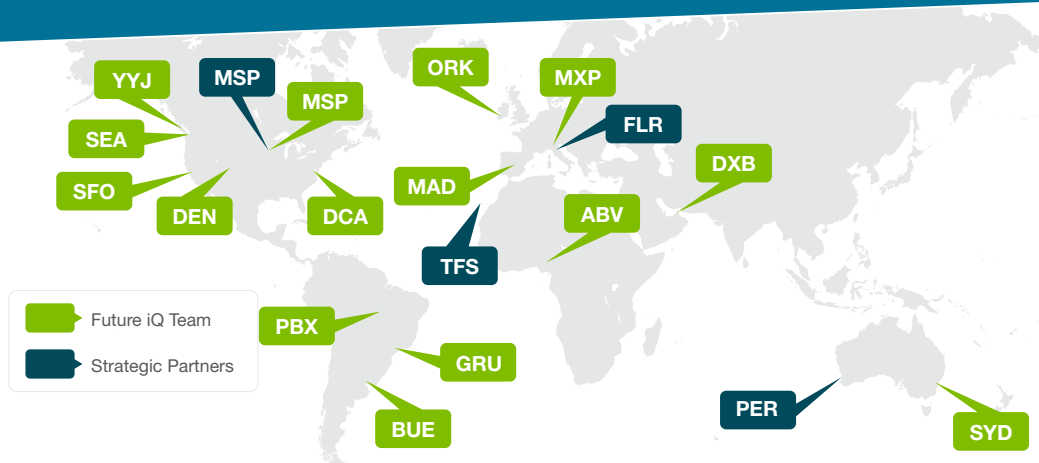New North, Inc.
600 N. Adams Street
Green Bay, WI 54307
Tel: 920-336-3860
Email: cloden@thenewnorth.com

8.0 ABOUT FUTURE IQ

Future iQ specializes in applying innovative tools and approaches to assist cities, organizations, regions and industries shape their economic and community futures. With nearly two decades of experience, the company has a global clientele spanning three continents. To learn more about Future iQ, and our recent projects **visit www.future-iq.com** or by email at **info@future-iq.com**

REPORT PREPARED BY:

David Beurle

CEO, Future iQ

Heather Branigin

VP Foresight Research

Marc Rassel

Creative Director

New North Business
Intelligence Think-Tank Report

New North Business
Intelligence Drivers Report

This New North Business Intelligence Driver Report and the companion report, New North Business Intelligence Think Tank Report, can be found on the New North website at https://www.thenewnorth.com/business-intelligence/business-intelligence-research-and-reports/

future→iQ®
Create **Future Intelligence**®