Jobs

Debra Lyons
Lyons Consulting

E: debralyons4@gmail.com
T: @DLyonsConsult
C: 478-960-6624

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Agenda

- I4: Fourth Industrial Revolution
- Future of Jobs in the age of I4
- How to prepare your community

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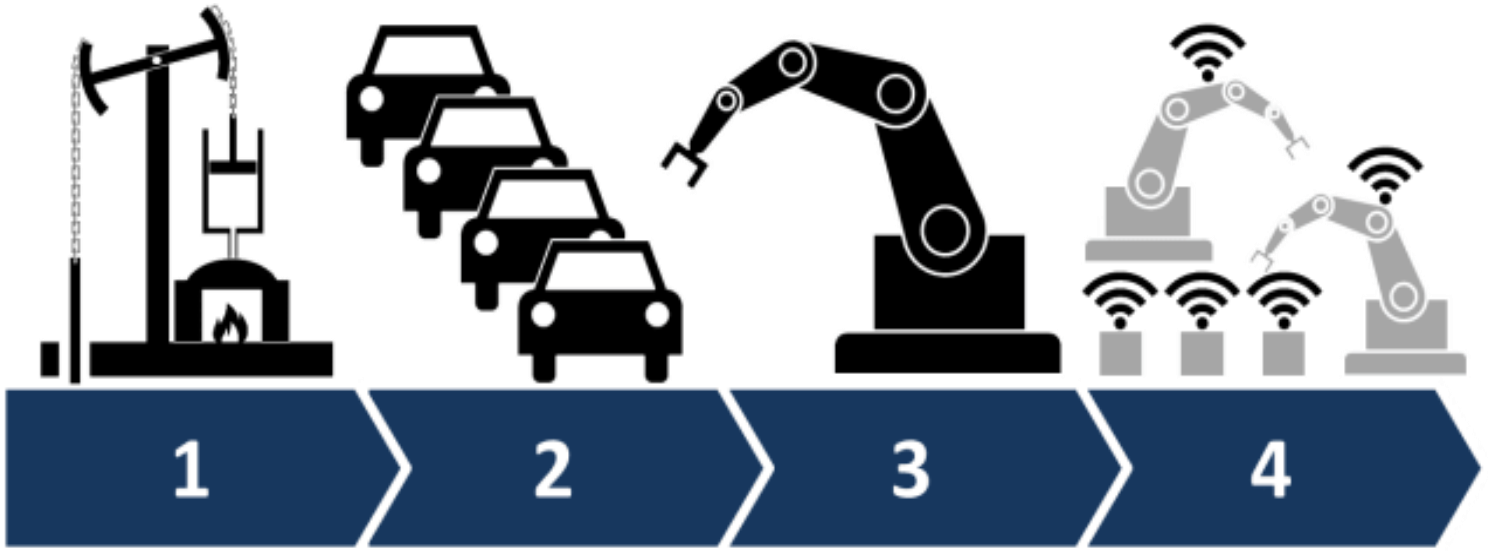
I4: Fourth Industrial Revolution



1	2	3	4
Mechanization, water power, steam power **1790**	Mass production, assembly line, electricity **1870**	Computer and automation **1980**	Cyber physical systems **2013**

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What is I4?

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Effect Differentiator?

Prepared Workforce

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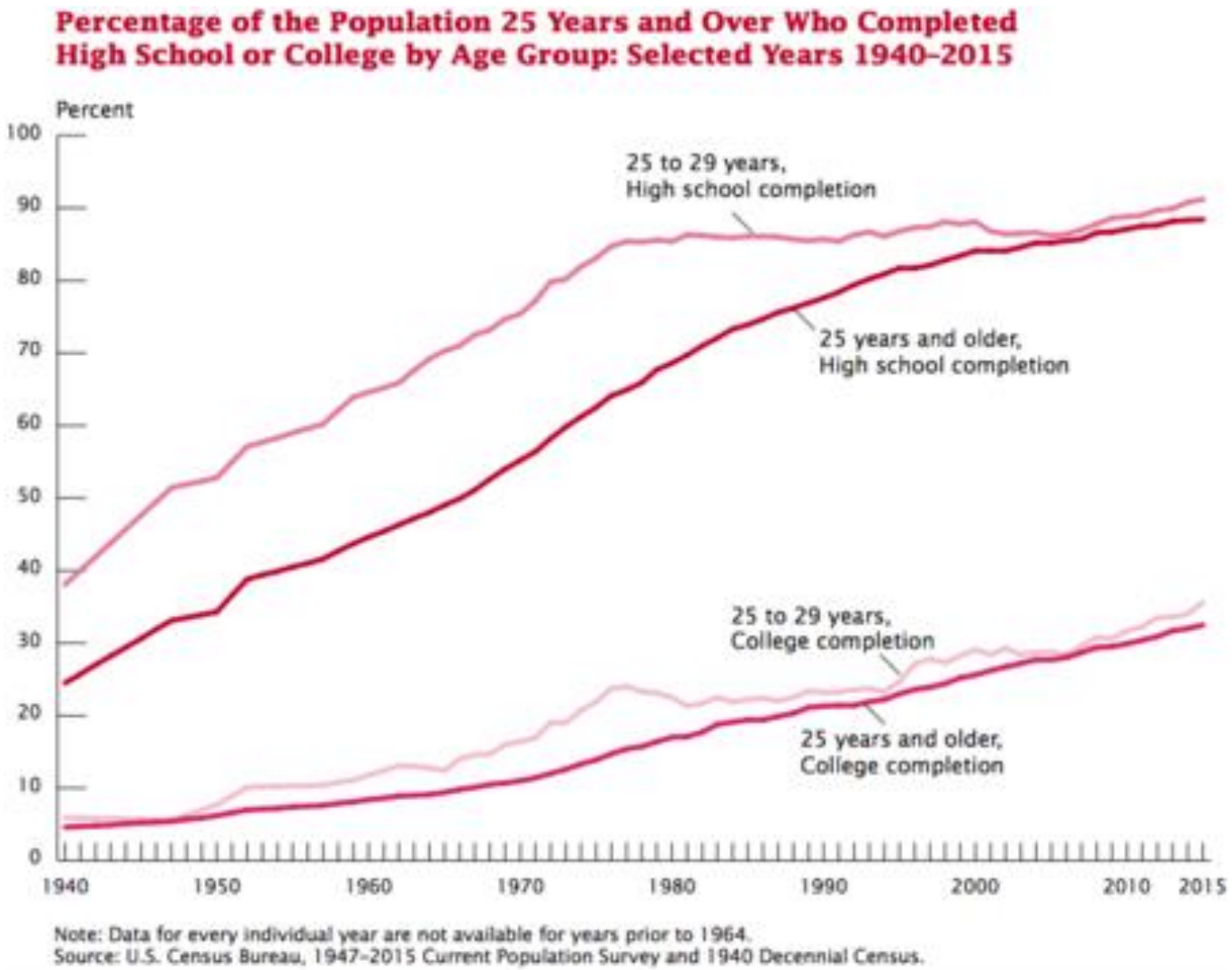
Education Trends



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Education 2015 PISA [Program for International Student Assessment] Comparison

U.S. students lag behind international peers

In tests of reading, math and science, U.S. 15-year-olds were outperformed by many of their counterparts in Asia and Europe — in some cases placing below the international average.

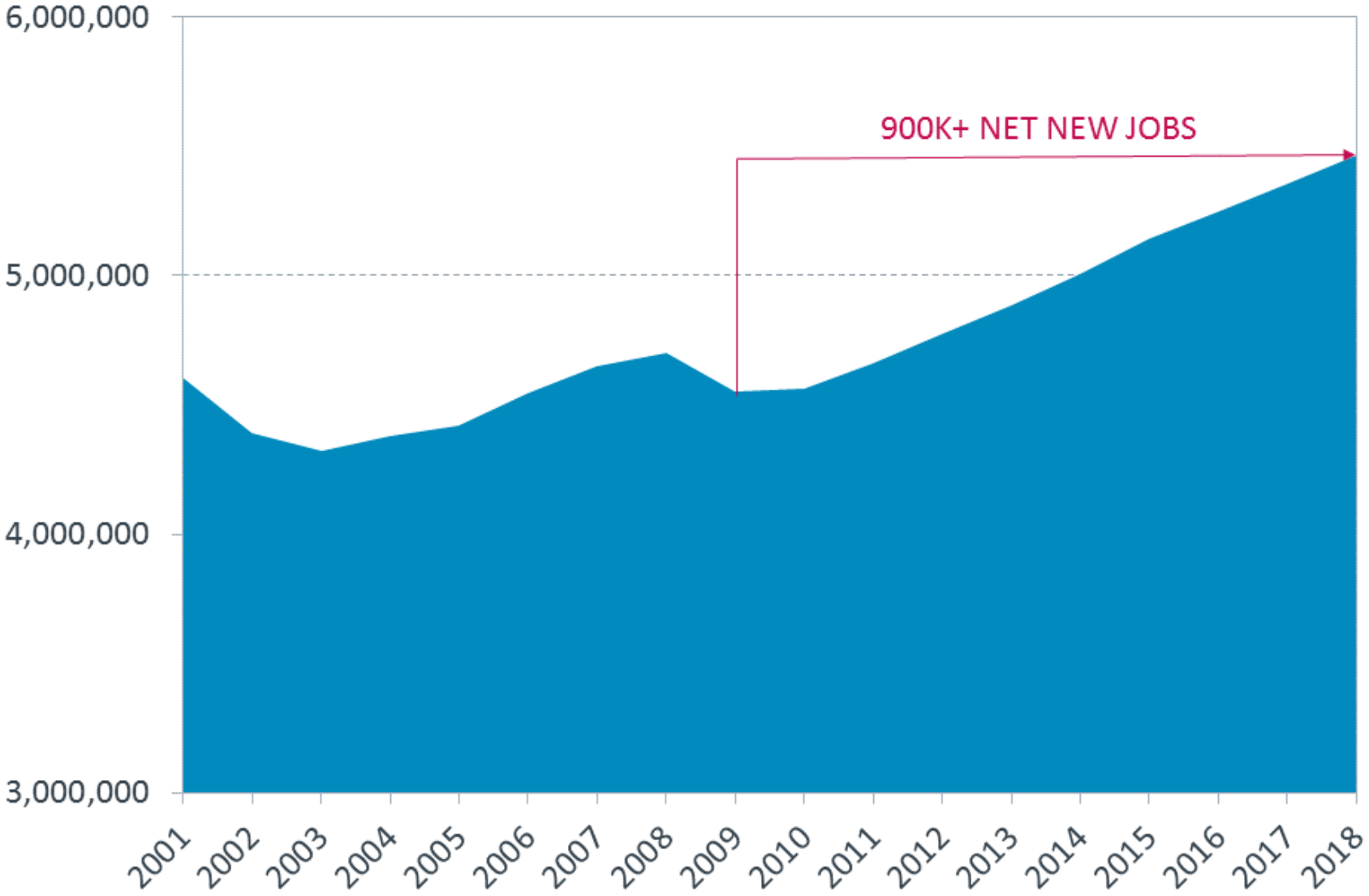
READING (Avg. 496)		MATH (Avg. 494)		SCIENCE (Avg. 501)	
1. Shanghai (China)	570	1. Shanghai (China)	613	1. Shanghai (China)	580
2. Hong Kong (China)	545	2. Singapore	573	2. Hong Kong (China)	555
3. Singapore	542	3. Hong Kong (China)	561	3. Singapore	551
4. Japan	538	4. Taiwan	560	4. Japan	547
5. S. Korea	536	5. S. Korea	554	5. Finland	545
6. Finland	524	6. Macao (China)	538	6. Estonia	541
7. Ireland	523	7. Japan	536	7. S. Korea	538
8. Taiwan	523	8. Liechtenstein	535	8. Vietnam	528
9. Canada	523	9. Switzerland	531	9. Poland	526
10. Poland	518	10. Netherlands	523	10. Canada	525
24. U.S.	**498**	**36. U.S.**	**481**	**28. U.S.**	**497**

NOTE: Scores were on a 1,000-point scale.

SOURCE: Organization for Economic Cooperation and Development

AP

U.S. Core Tech Occupation Employment, 2001-2018



CompTIA, Jan 2018

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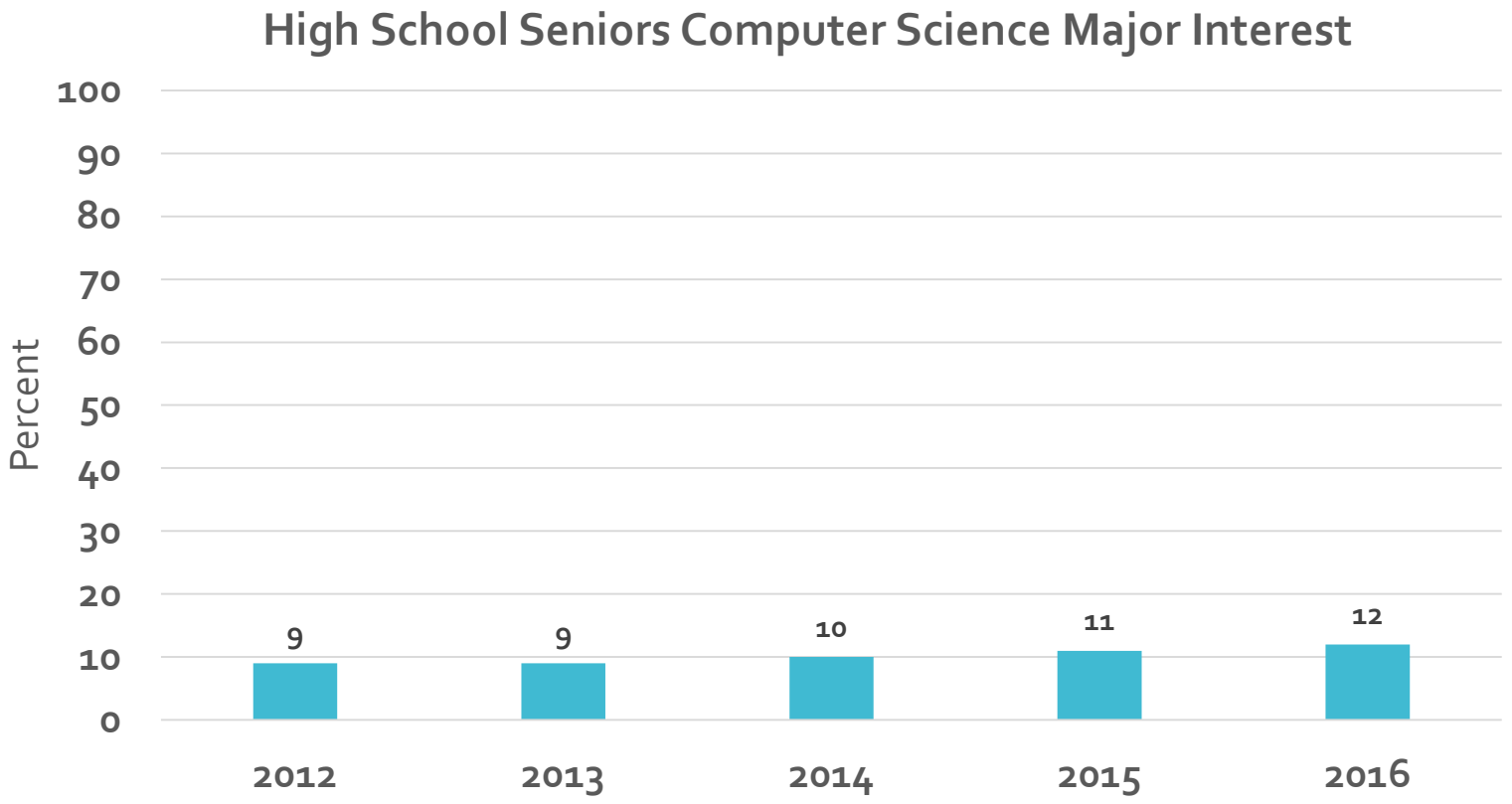
Information Technology Talent Pipeline



ACT 2016 STEM Report

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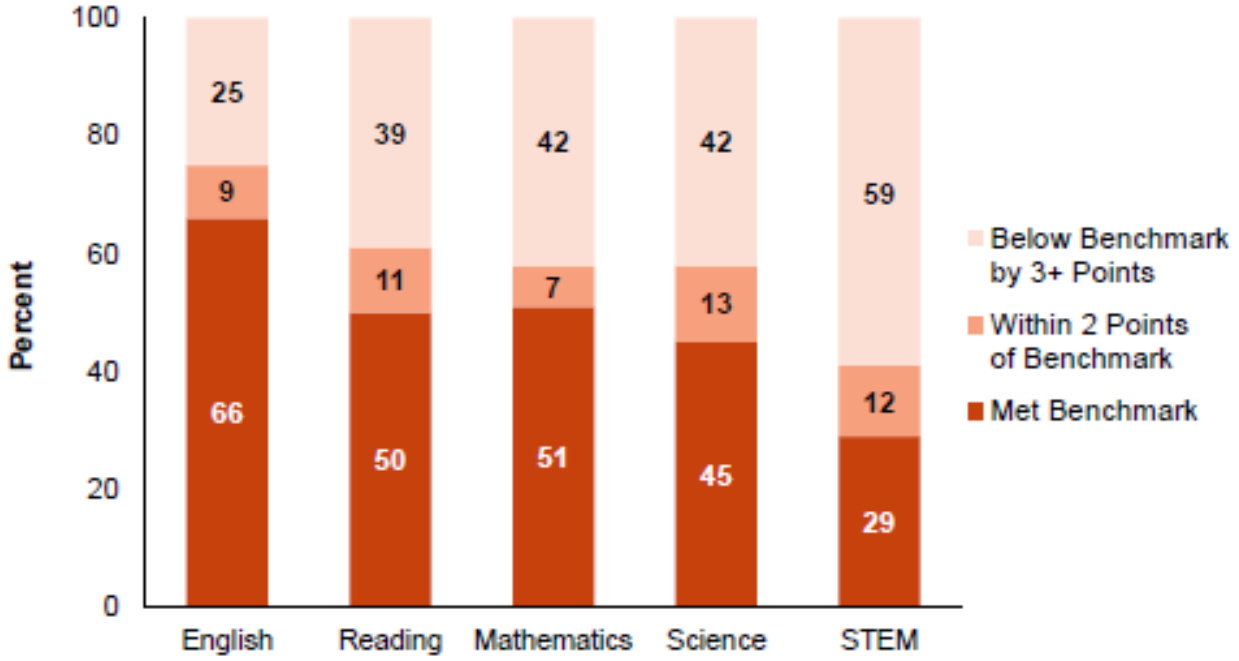
Information Technology Talent Pipeline Readiness

Overall STEM Interest (*N* = 117,086)

Percent of 2016 ACT-Tested High School Graduates by ACT College Readiness and STEM Benchmark Attainment



ACT 2016 STEM Report

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I4:
Job Augmentation

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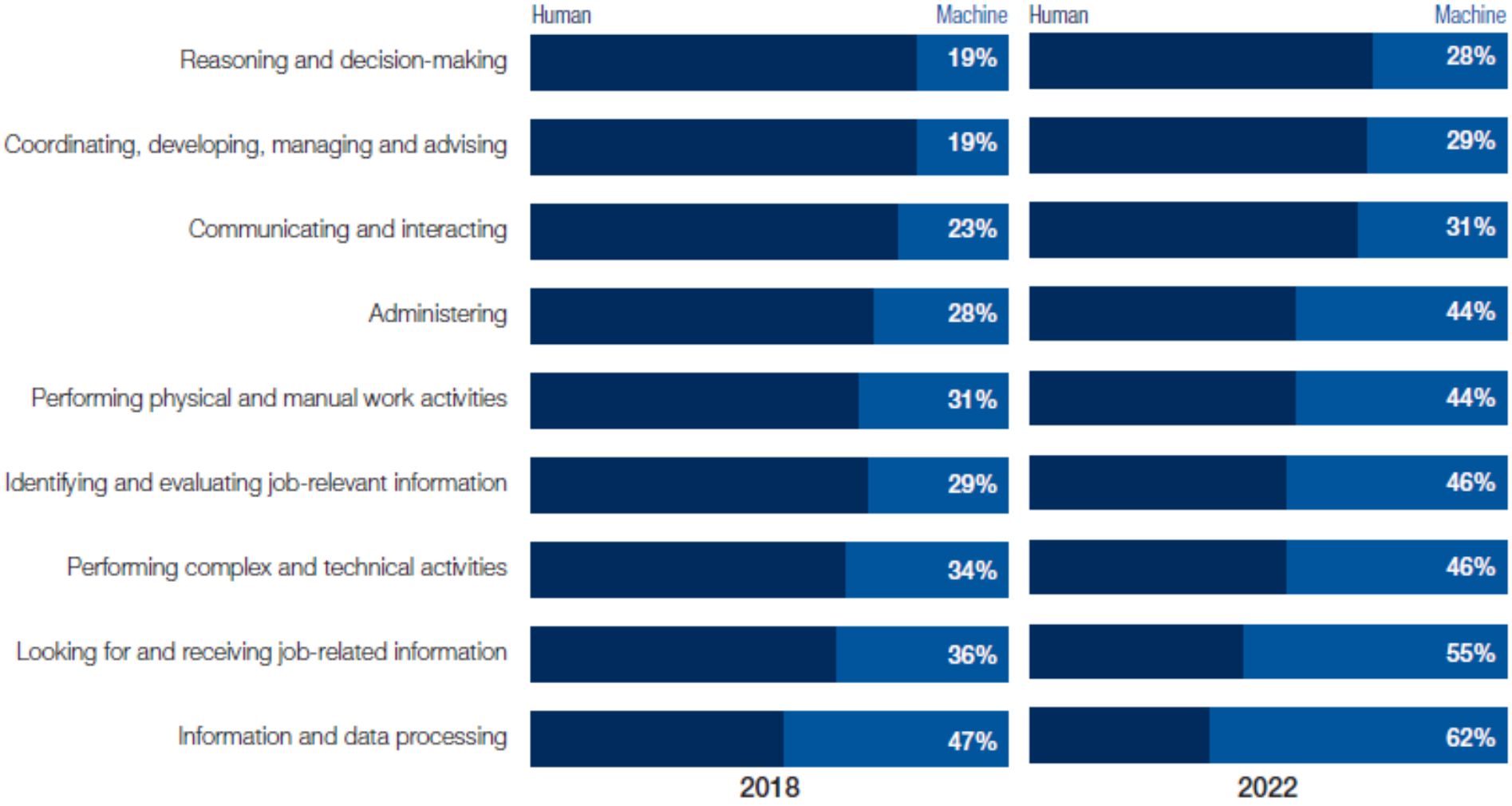
Figure 5: Ratio of human-machine working hours, 2018 vs. 2022 (projected)



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

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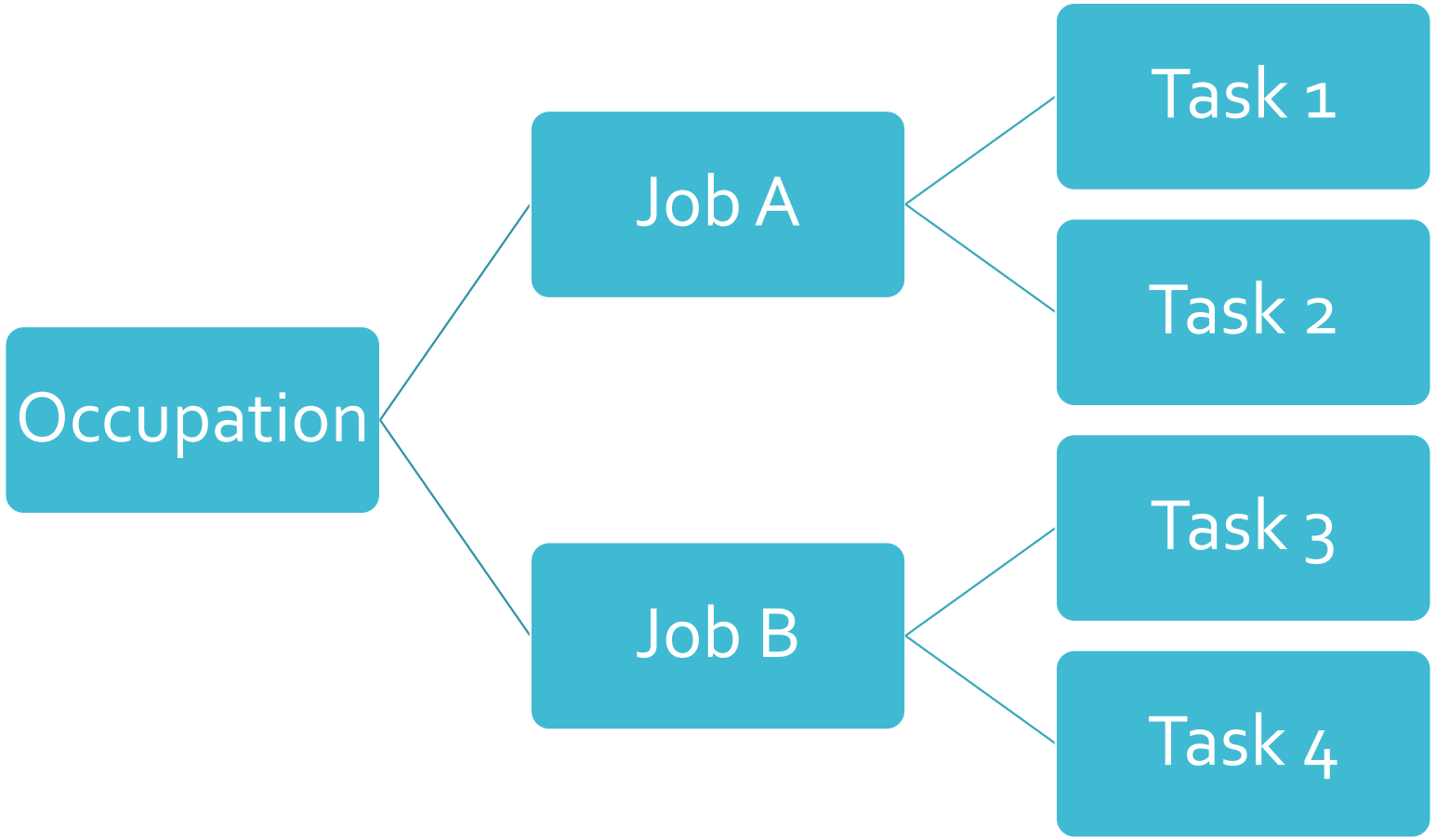
Job Analysis



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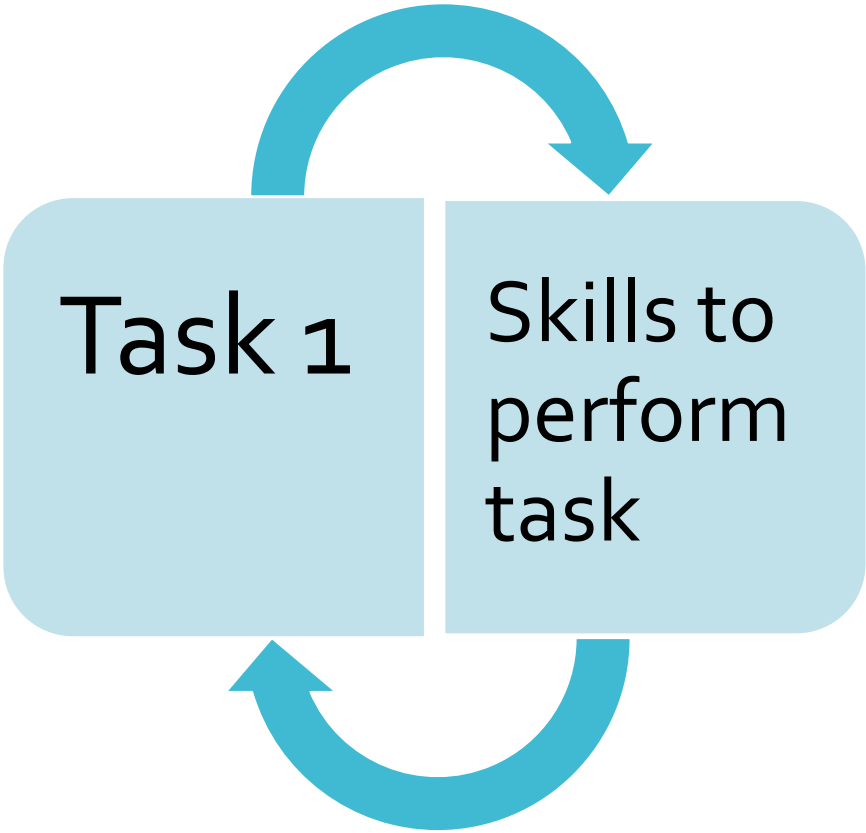
Tasks and Skills



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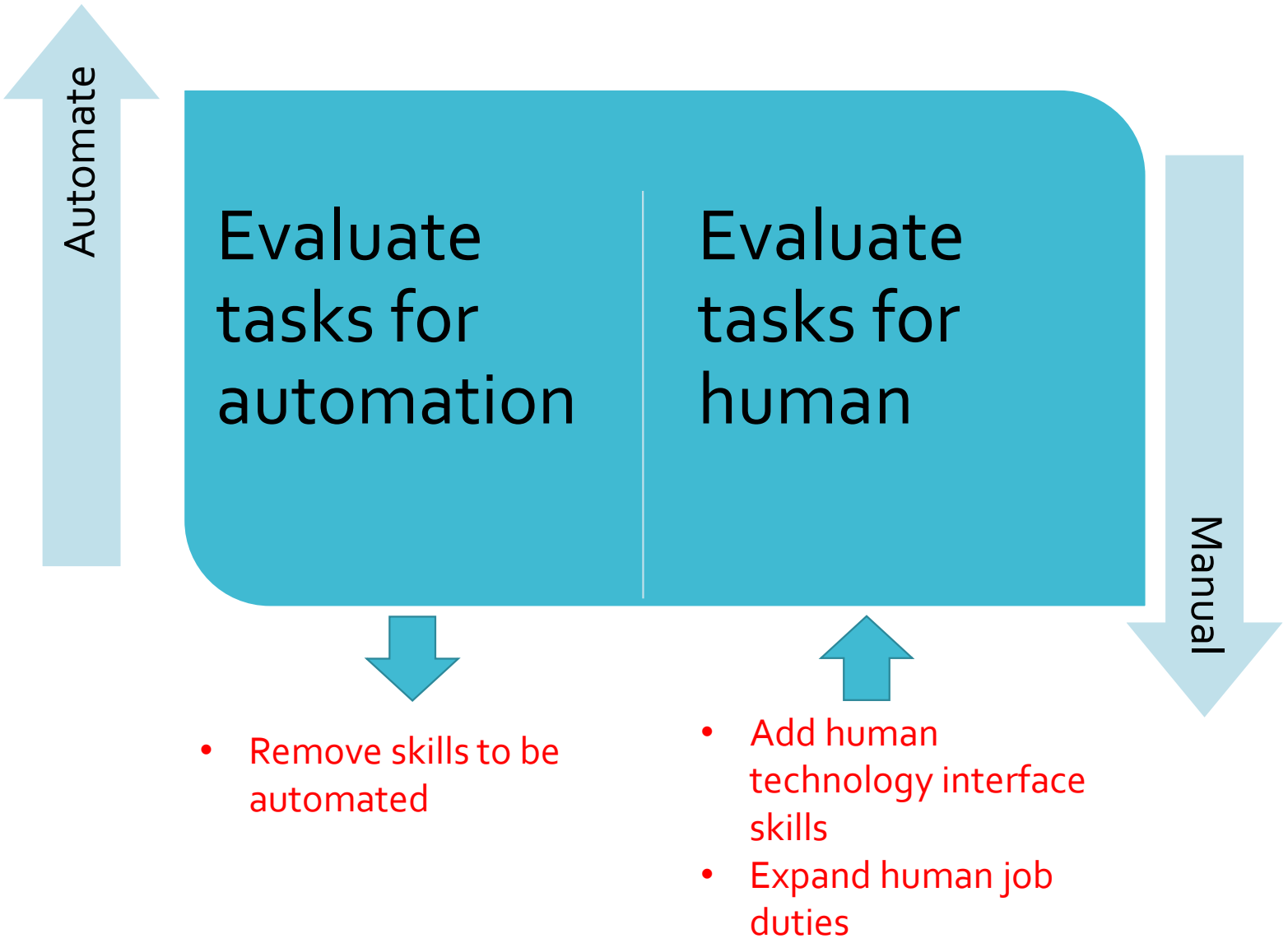
Job augmentation process



Skills: Hiring vs. Training

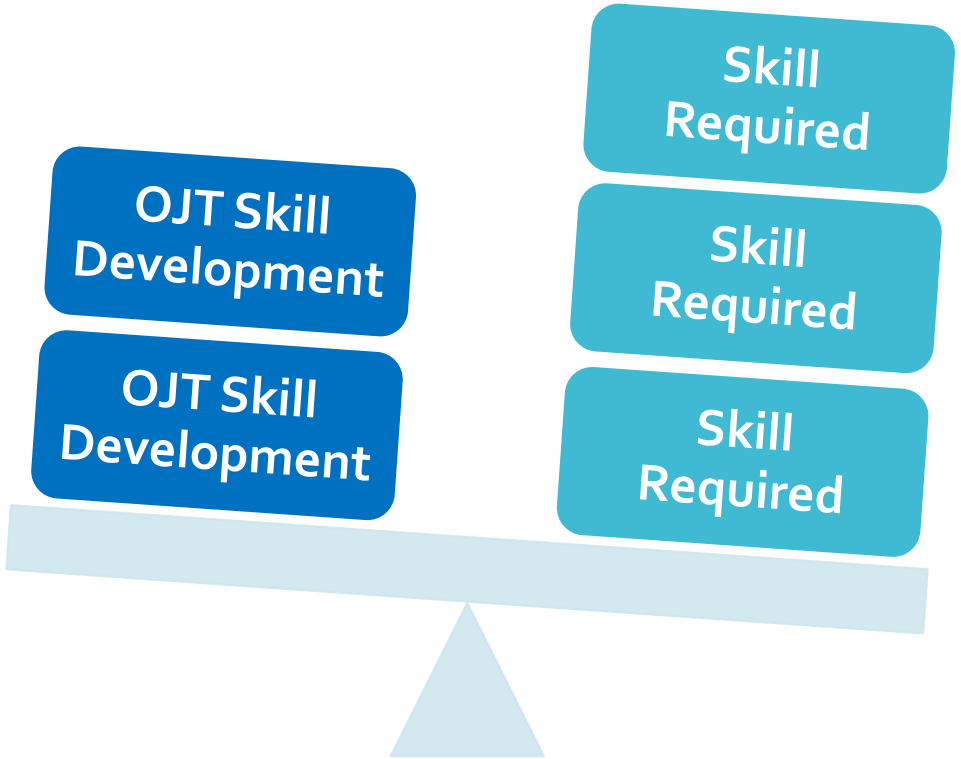


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Table 4: Comparing skills demand, 2018 vs. 2022, top ten

Today, 2018	Trending, 2022	Declining, 2022
Analytical thinking and innovation	Analytical thinking and innovation	Manual dexterity, endurance and precision
Complex problem-solving	Active learning and learning strategies	Memory, verbal, auditory and spatial abilities
Critical thinking and analysis	Creativity, originality and initiative	Management of financial, material resources
Active learning and learning strategies	Technology design and programming	Technology installation and maintenance
Creativity, originality and initiative	Critical thinking and analysis	Reading, writing, math and active listening
Attention to detail, trustworthiness	Complex problem-solving	Management of personnel
Emotional intelligence	Leadership and social influence	Quality control and safety awareness
Reasoning, problem-solving and ideation	Emotional intelligence	Coordination and time management
Leadership and social influence	Reasoning, problem-solving and ideation	Visual, auditory and speech abilities
Coordination and time management	Systems analysis and evaluation	Technology use, monitoring and control

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

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Over the next decade nearly 3 1/2 Million manufacturing jobs likely need to be filled
The skills gap is expected to result in 2 Million of those jobs being unfilled

CEOs and manufacturing executives around the world identify talent-driven innovation as the number one determinant of competitiveness.[1] Yet, manufacturing executives report a significant gap in their ability to find talent with required skills. More troubling...the skills gap is expected to grow substantially over the next decade. What impact could the gap have on company performance and how large is the gap likely to grow? The Manufacturing Institute and Deloitte conducted a study[2] to understand the impact and extent of the skills gap, and the study results are as follows:

Filling jobs is no easy task

84% of executives agree **there is a talent shortage in U.S. manufacturing**

It takes 90+ days to recruit highly skilled workers

- Other areas: 48 days
- vs. Skilled production workers: 70 days
- vs. Engineers, researchers, scientists: 94 days

80% of manufacturing companies **are willing to pay more** than the market rates in workforce areas reeling under talent crisis

SIX out of TEN **open skilled production positions** are unfilled due to talent shortage

The skills gap is widening

Over the next decade nearly 3 ½ million manufacturing jobs will likely be needed and

2015 — **2 Million** — 2025

are expected to go unfilled due to the skills gap

The implications are significant

Every job in manufacturing creates another 2.5 new jobs in local goods and services[3]

For every $1 invested in manufacturing, another $1.37 in additional value is created in other sectors[4]

2.7 Million *baby boomer retirements*

+ **700K** manufacturing jobs expected from economic expansion

3.4 Million *manufacturing jobs are likely to be needed over the next decade*

Only 1.4 Million jobs are likely to be filled

leading to an expected **2 Million** *manufacturing jobs unfilled due to the skills gap*

By 2025 the skills gap is expected to grow to ***2 million***

In 2011, ***600K*** jobs were unfilled due to the skills gap

The ***retirement*** of baby boomers, **strength of the economy** and *attractiveness of the industry* are ranked among leading factors impacting the talent shortage.

Developing talent is essential

Adding to the complexity is finding workers with the skills required to meet today's advanced manufacturing requirements

The most effective skilled production workforce development strategies cited by executives

- **94%** Internal employee training and development
- **72%** Involvement with local schools and community colleges
- **64%** External training and certification programs
- **49%** Creation of new veteran hiring programs

Percentage of executives that indicate current employees are not sufficient in key skills

- **70%** technology/ computer skills
- **67%** basic technical training
- **69%** problem solving skills
- **60%** math skills

Talent shortage impact to the business

82% of executives believe the skills gap will impact their ability to meet customer demand

executives also feel it will impact their ability to...

- *78%* implement new technologies and increase productivity
- *69%* provide effective customer service
- *62%* innovate and develop new products
- *48%* expand internationally

Deloitte. MANUFACTURING Institute

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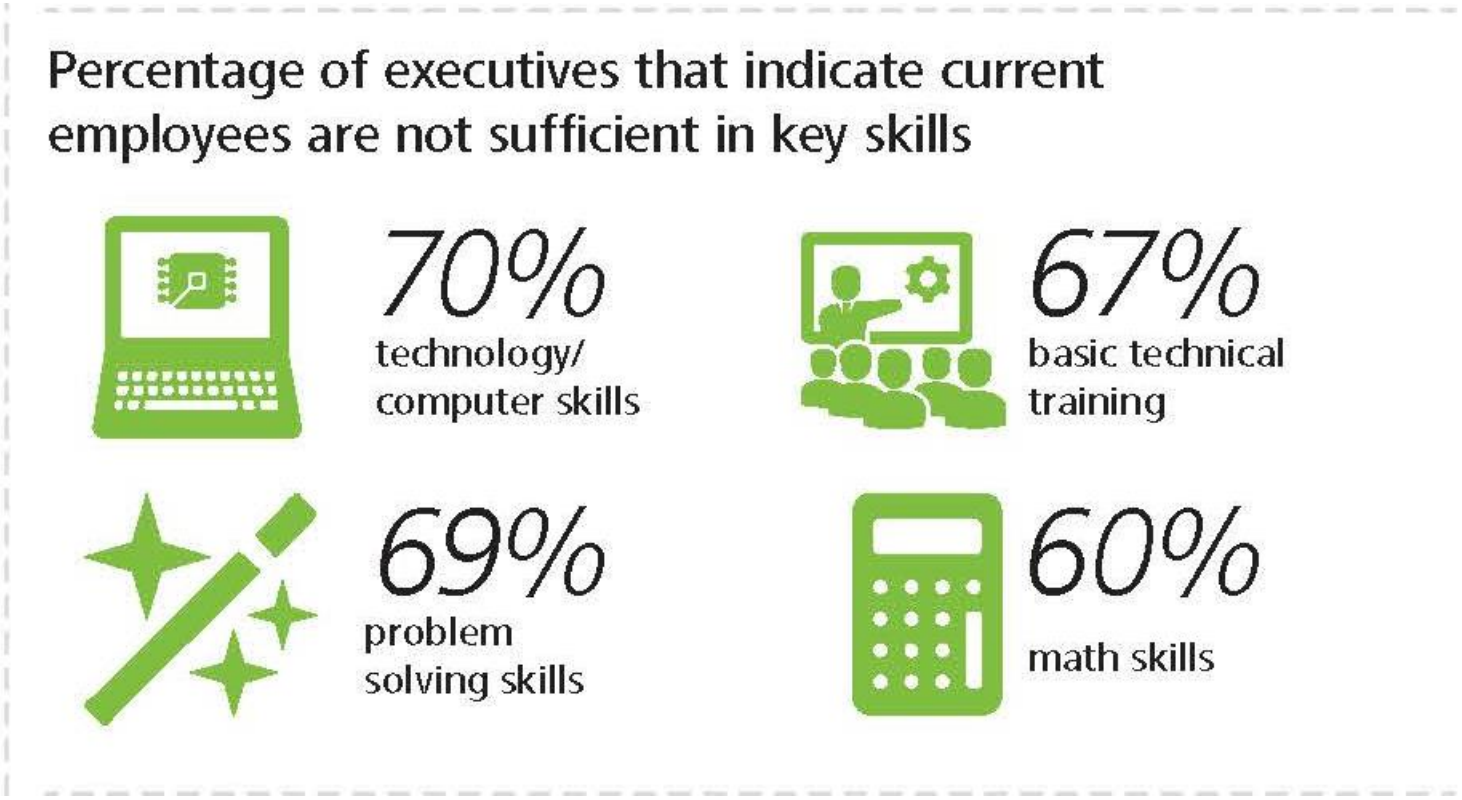
Sources include: Bureau of Labor Statistics (BLS) and Deloitte analysis

[1] Deloitte LLP and U.S. Council on Competitiveness, 2013 Global Manufacturing Competitiveness Index
[2] A nationally representative sample of 450 executives from companies of varying sizes and industries responded to the Skills Gap Survey.
[3] Milken Institute and Economic Planning Institute.
[4] The U.S. Department of Commerce, Bureau of Economic Analysis.

I4 is why there is an urgency for manufacturing labor with the 'right' skills



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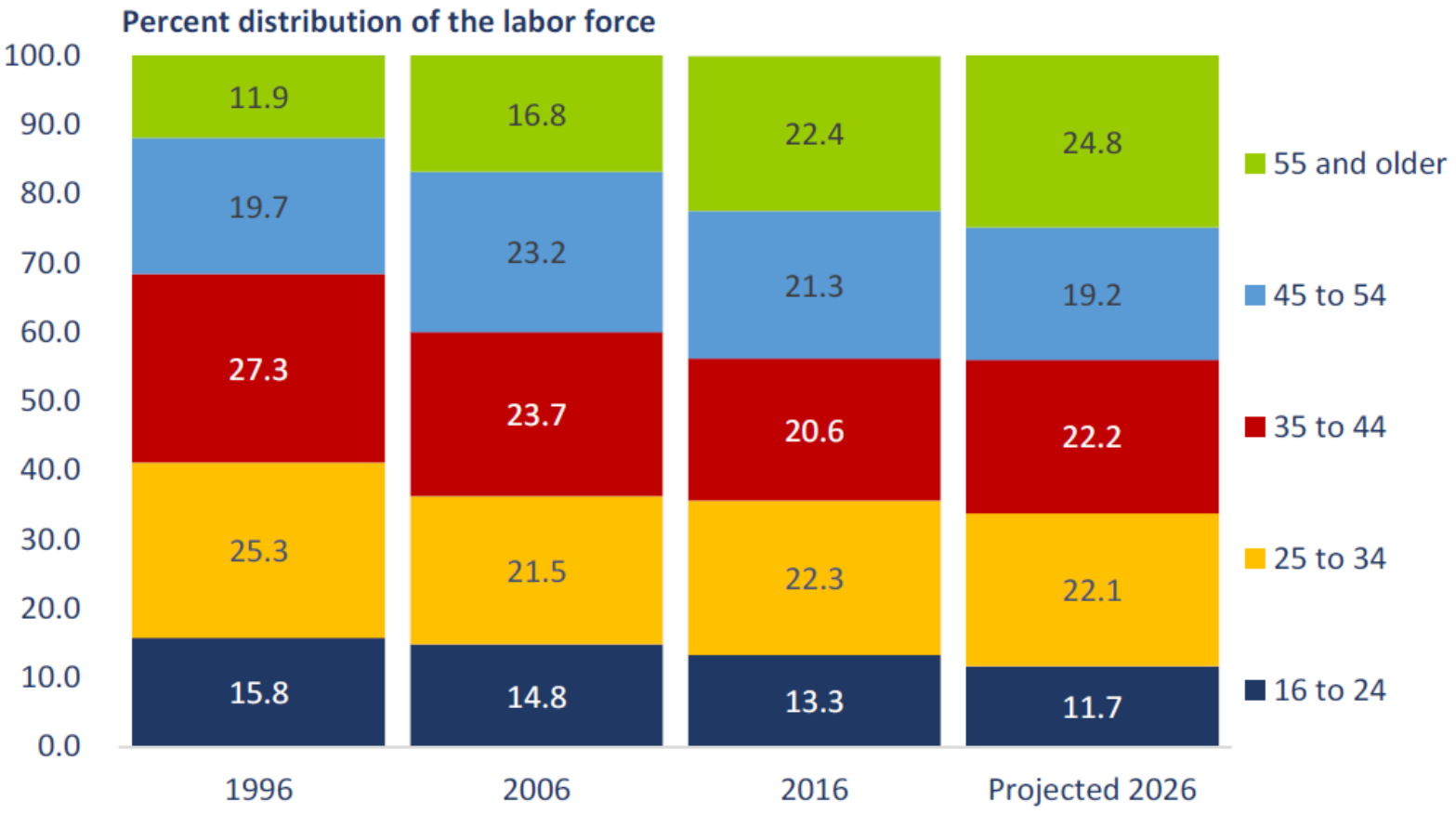
Future of Work

Chart 2. Labor force share, by age group, 1996, 2006, 2016, and projected 2026



Industry Approach

- Hire
- Automate
- Retrain

Figure 6: Projected (2022) strategies to address shifting skills needs, by proportion of companies (%)

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

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How to prepare the future workforce

- Ensuring mastery of fundamental foundational workplace skills
- Ensuring digital fluency, technical skills and systems analysis
- Developing innovation, creativity and leadership skills
- Developing a mastery of self-training and mindset for life-long learning
- Instilling career exploration and navigation
- Mastering occupational skills for current and emerging careers
- Instilling a sense of personal brand, building entrepreneurial mindset and importance of developing professional network
- Ensuring documentation and communication of skill mastery

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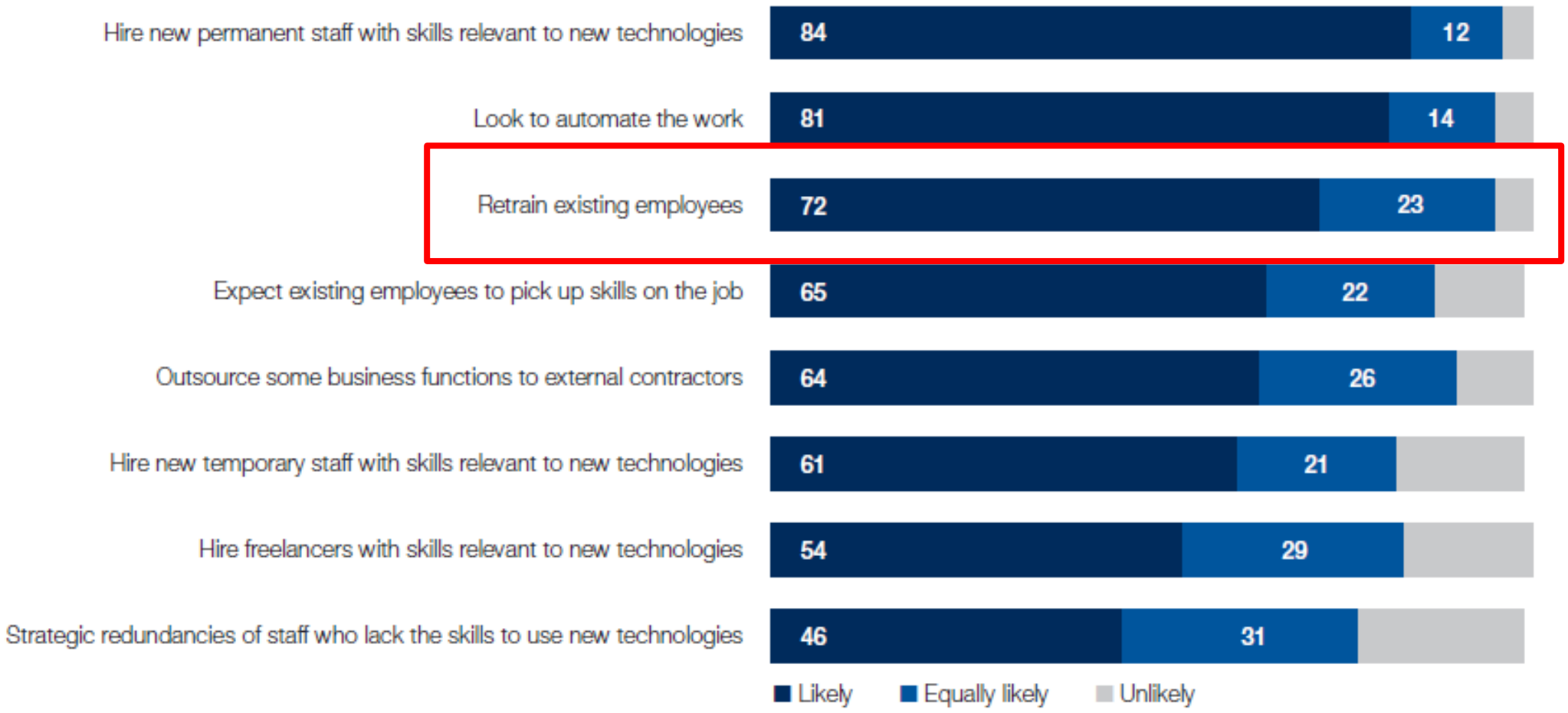
Figure 6: Projected (2022) strategies to address shifting skills needs, by proportion of companies (%)



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

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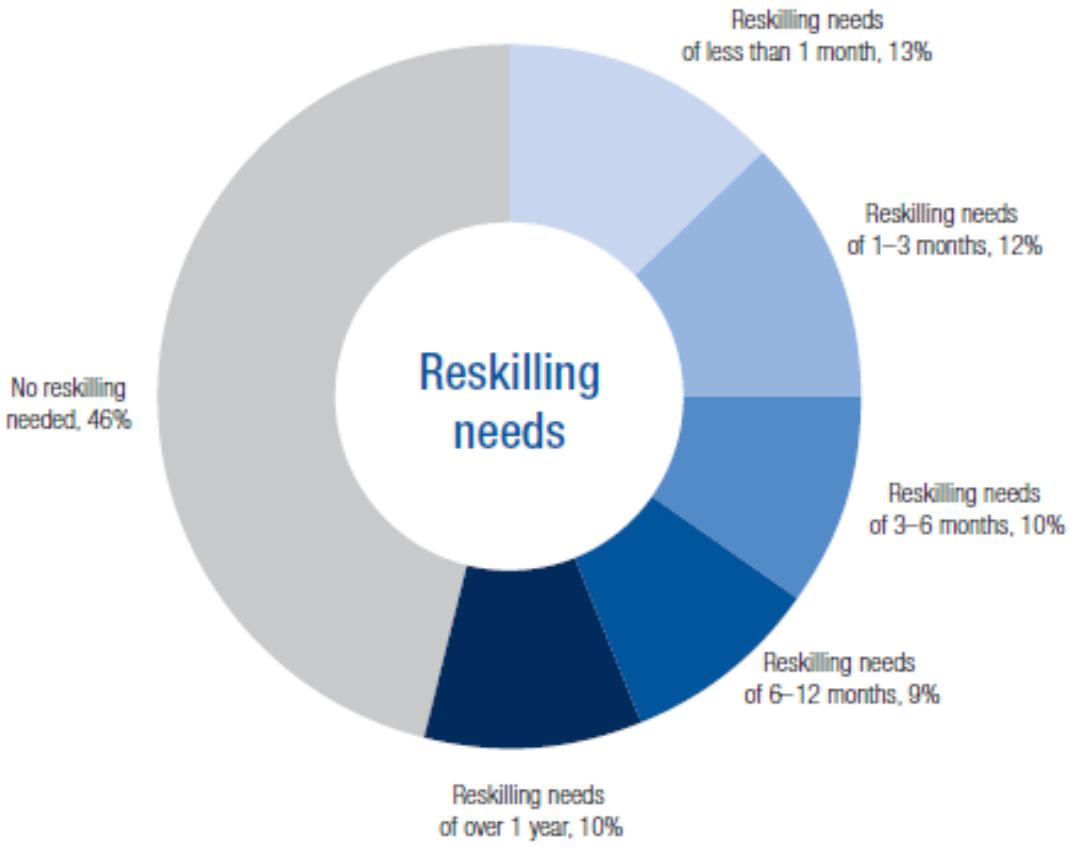
Time and resources required to reskill workforce

Figure 7: Expected average reskilling needs across companies, by share of employees, 2018–2022



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

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Preparing the future workforce

EDUCATION

Structured learning

Programs of study

Digital literacy

Social and emotional learning

Career navigation

Measured by Academic credentials & Portfolios

LIFE-LONG LEARNING

Self-learning

Work-based learning

Continuous training

Digital Literacy

Social and emotional mastery

Measured by Badging, Non-credit credentials, Occupational Credentials/Licensures, etc.

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New Workplace Demographics

What can economic developers do to prepare for the Future of Work?

- Gain an understanding of I4 and help community leaders understand its impact on business recruitment, retention and expansion
- Ensure workforce development strategies are a part of community economic development plans and focused on the rapidly changing job market
- Work with education community to ensure student preparation focuses on skills needed for success in the future job market
- Cultivate workforce development plan to grow technology skills and digital literacy
- Ensure workforce development plans focuses on both pipeline development and current workforce retraining
- Ensure implementation of workforce strategies have irrefutable proof of skilled workforce and differentiators

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Thank you!

Debra Lyons, Principal
Lyons Consulting

Look me up on **LinkedIn**!

Contact me at:

debralyons4@gmail.com
C: 478-960-6624

Follow me on Twitter:

@DLyonsConsult

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