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MARKET SEGMENT REPORT

Energy, Industrial & Transportation

INDUSTRY OVERVIEW

In today's world no industry is remaining unchanged as new technology, innovation and future- thinking gains traction at a record pace. The subset of industries that we will discuss in this report are some of the most highly impacted from these new ways of thinking and technology-enabled process improvement.

Manufacturing is becoming automated in many ways including round-the-clock production lines to batch processing to 3D printing. While many tasks in manufacturing are being automated, there is still high demand for the workforce to apply new ways of thinking that will evolve existing processes – improving efficiencies and outputs in manufacturing plants.

The well-established transportation industry is also experiencing massive change as they embrace the generational shift and technology transformation that comes with the new innovative ideas of younger generations. The possibilities of advances like highspeed trains, autonomous vehicles and re-imagined air travel.

The energy industry is facing significant growth as they invent new ways to power the world around us while causing as little impact to the Earth's resources at the same time. Power and utilities are evolving to now include concepts like smart grids, microgrids and high-capacity energy storage.

As each of these industries continue to transform in the way business is done, there will be challenges like talent supply shortages, misaligned skills to future needs and the aging workforce. As new generations of talent come into the workforce and older generations near the retirement age, companies must promote knowledge sharing and have an effective

method for ensuring all generations in the workforce are being managed and organized in the most effective ways.

Each of these challenges will cause organizations to change the ways they attract, hire and retain talent. With the workforce as the key to keeping these industries moving forward, talent needs to be top of mind for companies to maintain their trajectory towards their future growth and progression.



INDUSTRY OUTLOOK BY REGION

MARKET SEGMENT REPORT

Energy, Industrial & Transportation

LATIN AMERICA & SOUTH AMERICA

Manufacturing

Latin America is home to global leader of manufacturing companies

Mexico's Grupo Alfa, a high-tech aluminum engine heads and automobile parts, also a producer of petrochemical products

Companies throughout the region also face restrictive labor rules and sector-specific regulations across the region.

Energy

Smart Grid infrastructure throughout South America

The region plans to invest \$20.1 Billion to modernize their power grid through 2027

Mexico, General Electric plans to develop five energy storage projects to integrate solar and wind projects

Brazil, Chile and **Colombia** have recently established regulatory mandates enable smart metering deployments

Local vendors that will contribute to the initiative include Weg, ELO, Nansen, CAM

Brazil is the dominant employer of Bioenergy jobs holding 40% of the 3.2 millions jobs worldwide, accounting for 40% of all jobs

EUROPE

Energy

The Middle East has become a very attractive region for workers in the energy sector. Talent is attracted to the abundance of opportunities innovative companies, and fast-moving projects throughout the region



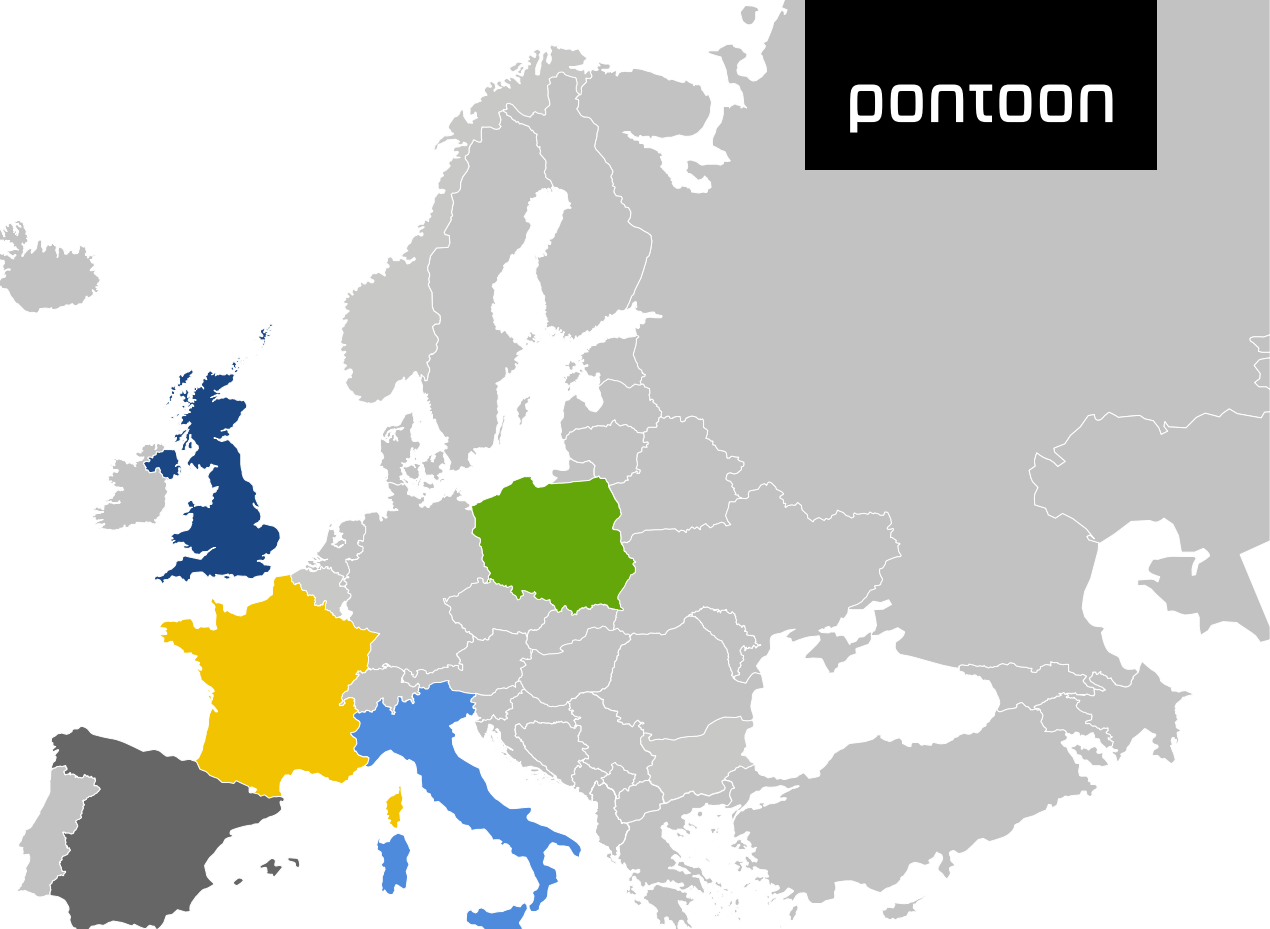
The **United Kingdom** ranks second in Europe for its number of renewable energy jobs. Solar PV accounts for 13,700 jobs, while biofuels and solid biomass each contribute about 10,000 jobs. Solar heating and cooling is just below 10,000



France is Europe's third-largest renewables employer, with 107,000 jobs; solid biomass and biofuels each employ more than 30,000 people.



Poland, **Spain** and **Italy** were the fourth, fifth and sixth-largest European employers



Aviation

- Anticipated CAGR growth 2.4% in Europe over between 2019-2024
- Increasing air passenger traffic to and from Europe will increase the demand for new aircraft. Airline will also be looking to expand and modernize their fleet.
- In response to increased movement pressure to fulfill defense expenditure (2% of GDP), several countries in Europe plan to increase their defense budget allocation in the coming years—a major share of this allocation will be for military combat jets.
- Travelers interested in reducing their travel time are increasing their use of charter and private jets which is driving the general aviation market in Europe.

ASIA PACIFIC

Manufacturing

Mainland China is referred to as the “The World’s Factory”

The Chinese manufacturing cost is now only **4% cheaper than in the US**

Average annual manufacturing wages in China have increased by **80%** in last year

The US - China trade war is causing manufacturers to transform their business models from being export dependent to now focus on domestic consumption. As a result, sales, business development and marketers are highly sought after professionals in mainland China currently.

Energy

Asia as a whole retained a **60%** share of the total renewable energy jobs market while China holds **39%** of all renewable energy jobs

Singapore is home to one of the largest Energy and Industry based in the world. The nation’s oil exports amounted to **68.1 million tons** in 2017 which positively impacted growth in the chemical industry and manufacturing of gas and oil equipment in recent years.

NORTH AMERICA

Manufacturing

In America, 89% manufacturing companies struggle to fill their open positions

Generating 11.6% of U.S. economic output and employing 8.5% of the workforce but face tough talent shortages caused by:

- Shifting skill sets due to advancing technologies
- Misperceptions of manufacturing jobs
- Retirement of baby boomers

Future of Jobs in American Manufacturing

Over the next ten years: manufacturers will need to add 4.6 million manufacturing jobs — 2.4 million of which may go unfilled

Today, more than 500,000 manufacturing jobs remain vacant in the United States due to the current talent shortage

Energy

Despite market forces, technology changes, tax policy and new federal regulations, the US Energy sector has seen significant job growth



Fuels sector employed 11 million people in 2018 – up 4.8% from 2017



Energy efficiency products and services added 76,000 jobs last year to employ 2.35 million Americans last year



Oil and gas extraction and support services reached it highest level of employment since the fall of 2014

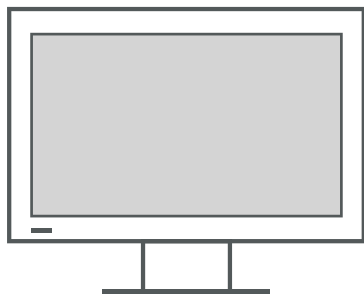
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INDUSTRY TRENDS

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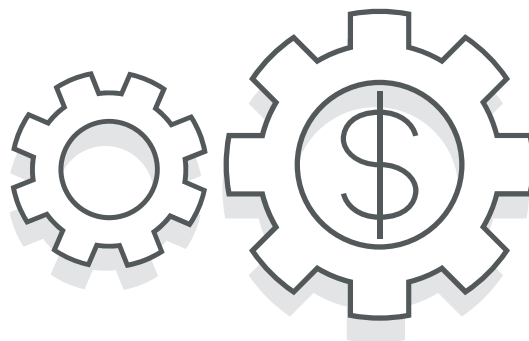
INTEGRATING NEW TECHNOLOGY



Digital Design, Simulation and Integration (DDSI)

Car manufacturers are using DDSI for:

- Design automation
- Plant design optimizations
- Product design & testing
- Drafting & 3D modeling



Robotics

Robotics are quickly being integrated in aerospace manufacturing environments to:

- Increase product quality
- Yield rates
- Reduce operating costs
- Production performance
- Improve time-to-customer delivery



Advanced Analytics

Data collected from across the plant floor is compiled and analyzed to create Manufacturing Intelligence. This information is then used to:

- Improve product quality
- Reduce production delays
- Improve time-to-market for new products



JOBS IN INDUSTRIAL

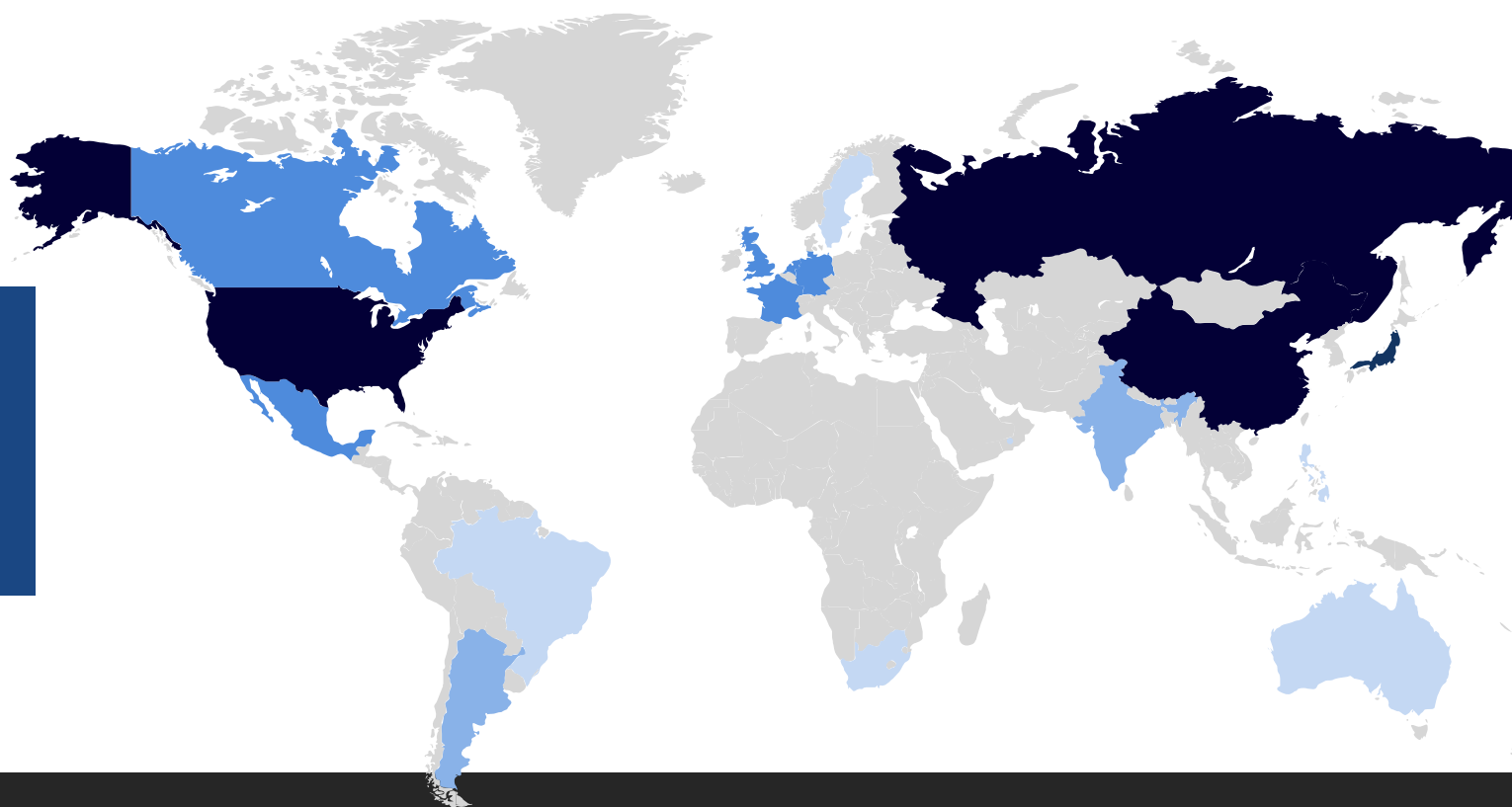
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CURRENT OPEN JOBS BY COUNTRY

Employer hiring in Industrial

This map shows the number of positions currently open on TalentNeuron in Industrial in each country from Manufacturing/ Resources functions



218,419 jobs open in Americas

North America

US	128,176
Mexico	35,252
Canada	44,982

South America

Argentina	1,661
Brazil	8,348

294,977 jobs open in EMEA

Belgium	9,886
France	23,436
Germany	28,177
Netherlands	30,868
Russia	163,766
Sweden	3,082
UK	33,279
South Africa	2,483

289,148 jobs open in APAC

Australia	4,689
Philippines	3,525
China	190,084
India	16,234
Japan	73,274
Singapore	1,342

FUTURE OF JOBS

Automotive, Aerospace, Supply Chain & Transport

Emerging occupations

Advances in innovation will require a re-skilled workforce responsible for harnessing the capabilities of that new technologies will bring to the Industrial sector

- Data Analysts and Scientists
- AI and Machine Learning Specialists
- Process Automation Specialists
- Software and Applications Developers and Analysts
- Innovation Professionals
- Service and Solutions Designers
- Product Managers
- Industrial and Production Engineers
- Supply Chain and Logistics Specialists



Diminishing Occupations

Robotic Process Automation has replaced many of the functions traditionally completed within these roles. Reduced by 34% in 2018 and projection in 2022 show these roles down by 24%

- Assembly and Factory Workers
- Data Entry Clerks
- Client Information and Customer Service Workers
- Accountants and Auditors
- Accounting, Bookkeeping and Payroll Clerks
- Administrative and Executive Secretaries
- Transportation Attendants and Conductors
- Material-Recording and Stock-Keeping Clerks
- Business Services and Administration Managers

FUTURE OF JOBS

Energy Utilities & Technologies

Emerging Occupations

Data Analysts and Scientists
Organizational Development Specialists
Renewable Energy Engineers
Digital Transformation Specialists
Big Data Specialists
Software and Applications Developers
Process Automation Specialists
AI and Machine Learning Specialists
Innovation Professionals



Diminishing Occupations

Data Entry Clerks
Mechanics and Machinery Repairers
Power Production Plant Operators
Petroleum and Natural Gas Refining Plant Operators
Material-Recording and Stock-Keeping Clerks
Assembly and Factory Workers
Sales Representatives, Wholesale and Manufacturing,
Technical and Scientific Products

FUTURE OF JOBS

Chemistry, Advanced Materials & Biotechnology

Emerging Occupations

General and Operations Managers
AI and Machine Learning Specialists
Sales and Marketing Professionals
Organizational Development Specialists
Mechanical Engineers
Data Analysts and Scientists
Research and Development Officers
New Technology Specialists
Innovation Professionals



Diminishing Occupations

Data Entry Clerks
Assembly and Factory Workers
Accounting, Bookkeeping and Payroll Clerks
Sales and Purchasing Agents and Brokers

SHIFTING JOB SKILLS

Digital Manufacturing and Design Technology

As manufacturing shifts toward digital efficiency and technology-enabled production, the workforce will also need to shift their skills

Past

- Monitor production lines
- Manual parts assembly
- Perform routine maintenance on machines

Future

- Determine how technology can be applied within the environment
- Optimize processes to increase automation efficiency
- Analyze production data to determine alternative cost-saving methods

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TALENT

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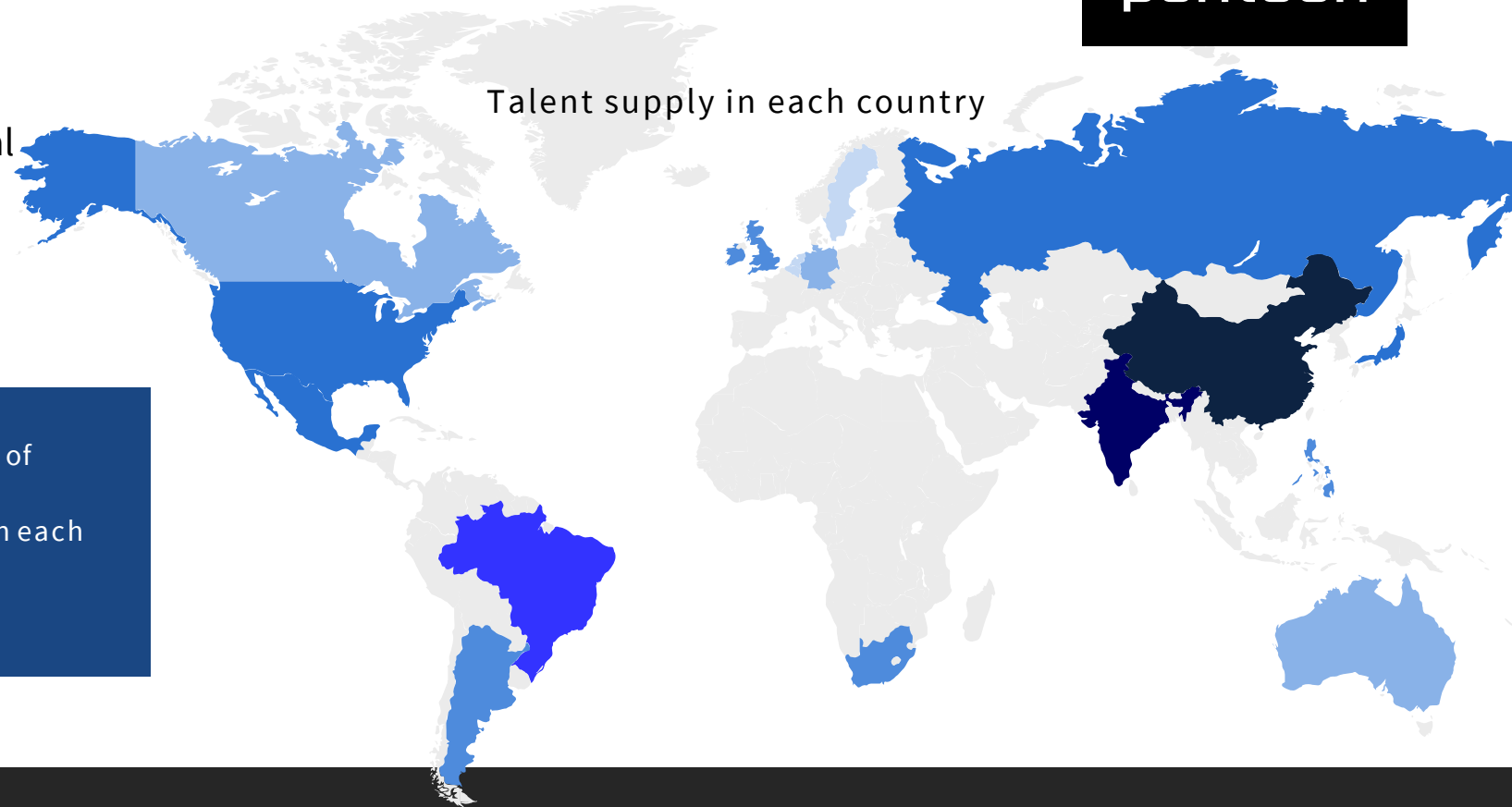
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TALENT BY REGION

Workforce supply in Industrial

Talent supply in each country

This map shows the number of positions currently open on TalentNeuron in Industrial in each country from Manufacturing/ Resources functions



53,126,000 professionals in Americas

North America

United States	11,698,000
Canada	2,918,000
Mexico	10,669,000

South America

Argentina	2,501,000
Brazil	25,340,000

26,882,000 professionals in EMEA

Belgium	492,000
France	2,495,000
Germany	3,878,000
Netherlands	731,000
Sweden	449,000
Russia	10,359,000
UK	3,345,000
South Africa	3,087,000

774,095,000 professionals in APAC

Australia	929,000
Philippines	12,246,000
China	493,872,000
Japan	9,976,000
India	257,012,000
Singapore	60,000

THE TALENT GENERATION GAP

Energy/ Utilities

Organizations in Energy and Utilities sector are feeling the effects of the generational talent gap as a majority of their workforce is closing in on retirement age

4 out 5 five chief executives in the sector are planning to do more to strengthen employee engagement

63% of chief executives in the sector they will invest more in creating and fostering a skilled workforce over the next three years

Organizations must have the proper measures in place for knowledge transfer of critical operational information but still allow new ways of thinking as new generations enter the workforce



Aerospace / Aviation

Demand is going to reach record numbers in the coming years:
790,000 new pilots will be needed by 2037
600,000 new commercial airline technicians required around the world by 2036
60,000 additional managers needed

The growing need for talent is the result of:

- widespread retirements in the current generation of aviation professionals
- competition with other industries for skilled employees
- insufficient training capacity to meet the demands

Solutions to this is aerospace organizations collaborating with university, executive training programs and apprenticeships.



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RISKS AND CHALLENGES

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CURRENT CHALLENGES

Trend

Talent Shortage

Over the next ten years, manufacturers will likely need to add 4.6 million manufacturing jobs — 2.4 million of which may go unfilled

Misaligned Skills of the Future

59% of employers in the aerospace industry are concerned that a scarcity of skilled engineers could pose a threat to their business in the future

Lack of New Entrants to the Industry

There will be a need for 105,000 new jobs in the smart grid and electric utility industry by 2030, but only 25,000 existing industry personnel are expected to be interested in filling those positions

Maturing Workforce

Nearly one third (27%) of manufacturing worker are age 55 and older

Newcomers are not training in high enough numbers to replace the retirees

Solution

Companies will need to look at alternative talent pools for freelance and gig workers to prevent the disruption in production that results from the lack of talent

To become future-ready and maintain growth in the industry, workers will need to participate in in-house or external training programs to learn new skills like robotics and automation

Hire from talent pools that hold STEM degree but are often overlooked in favor of new grads. These include: veterans, women returning to work, workers with disabilities, part-time workers, immigrants

The existing workforce will need to be re-skilled to learn senior management tasks currently performed by the retiring generation



TOOLKIT TO ADDRESS CURRENT TREND & CHALLENGES

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SKILLS GAP

Growing the skills of the existing workforce



The skills gap in manufacturing may leave an estimated
2.4 million positions unfilled over the next
10 years – Deloitte



How to Close the Skills Gap

Offer external training
 courses to employees
 through **General
 Assembly**

Inter-department
 shadowing of
 colleagues to
**develop additional
 skills**

**Learning and
 development
 courses** to develop
 skills of existing
 workforce

TALENT SHORTAGE

Managing the workload with fewer traditional workers



58% of companies said they use gig workers to access skills and experience that is not available in their current workforce – Forbes



How to Win the War for Talent

Access to large pools of freelancers candidates for project-based work

Re-skill existing workforce with General Assembly courses

Partner with **Lee Hecht Harrison** to restructure the current workforce to best utilize the employees

COMPETING FOR TALENT

Attracting talent in a limited market



Prospective candidates want to join companies that offer opportunities for growth and outlets for creativity

Organizations must set themselves apart from the pack to attract top tier talent



Win talent with a strong employer brand

Promote a workplace that:

Fosters
innovation
among your
workforce

Provides learning
opportunities for
skills
development
with **General
Assembly**

Offers
competitive
pay, benefits,
bonuses,
incentives

Offers flexible
work
arrangements

WORKFORCE 2.0 - FREELANCERS

New composition of the workforce



Freelancers will make up
50% of the workforce
by 2025

“Legacy models of employment will be “dissolved and replaced with talent marketplaces driven by the surge of on-demand labor platforms and online work management solutions.” –Accenture

Ways to prepare for the Gig Economy

Evaluate what part of the business can be outsourced to freelancer
– project work, seasonal influxes

Tap into the freelancer talent pool
by implementing an FMS tool



ADDRESSING TRENDS & CHALLENGES WITH PONTOON'S ECOSYSTEM

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Adecco



BADENOCH
+ CLARK



LEE HECHT
HARRISON

modis

Spring
Professional

VETTERY 

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GENERAL ASSEMBLY

Building the talent pool by up-skilling and re-skilling

Pontoon's partnership with General Assembly faces this issue head on. GA aims to identify skills that are most in demand then provide training to increase the number of skilled workers in a given market

Today's talent shortage is being felt across the global and across all industries. Industrial and manufacturing are seeing the effects of advances in technology in many skillsets and not enough talent to keep up with the changes landscape of this field.

Employees can enroll in programs while working in their current role with plans to transition into the new roles or expand responsibilities once the GA programs have been completed



We must focus on developing the skills within the current workforce as the world of work rapidly transforms



GENERAL ASSEMBLY

LEE HECHT HARRISON

Transforming the workforce

Lee Hecht Harrison has the expertise to guide organizations through strategic workforce transformation. With AI driven services including internal talent redeploy, outplacement and change management program, LHH will guide companies to be most effective in the current tight labor market

LHH has the capability to identify talented candidates through their powerful AI platform reaching of all levels and industries. Retaining and engaging talent is done through career development and coaching of both employees and leadership.

Employers can leverage Lee Hecht Harrison's industry insight to optimize their workforce developing leaders be a consultative partner best suit business needs.



“The alignment between organizational talent needs and an individual's career goals can be a potent force that not only prepares your organization to meet the challenge of business transformation, but also boosts engagement, retention and productivity.”

Melanie Stave SVP, Talent Development Practice Leader, LHH

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THANK YOU

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