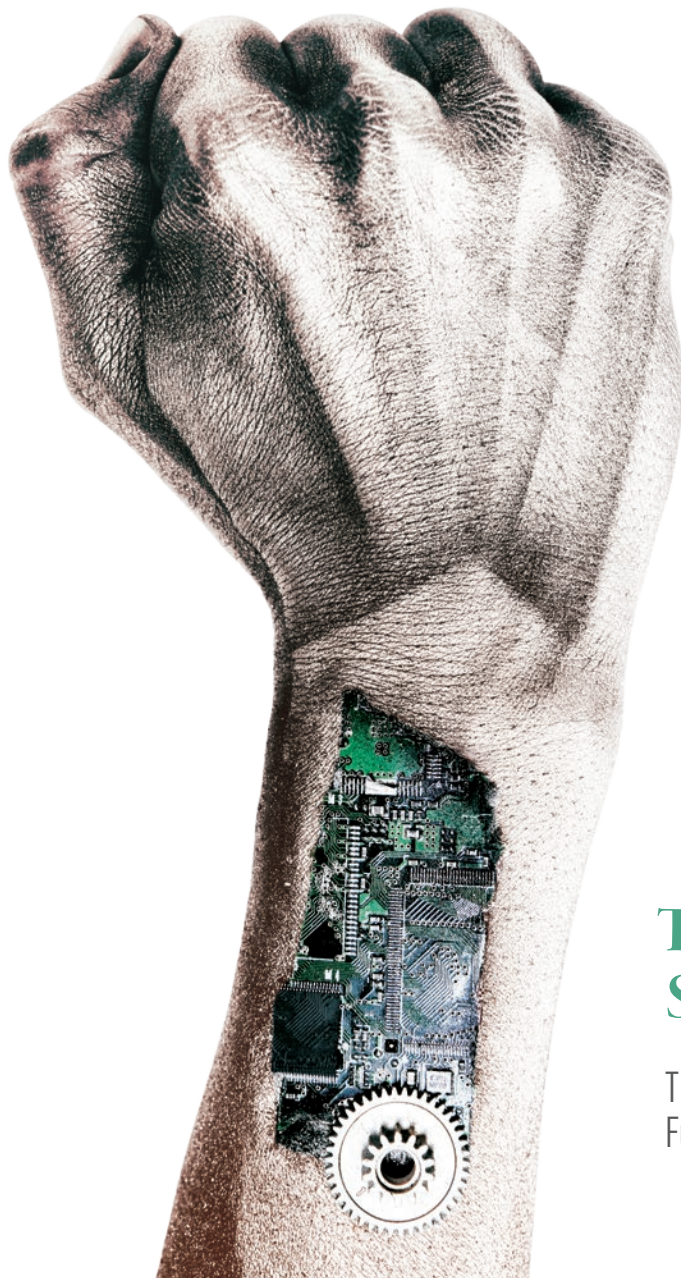


2019

Global Industrial Report

BAIRD



The Great Skills Shift

The Forces Driving the
Future of Industrial Labor



CONTENTS

2 **Owning the Challenge**

C-Suite Perspective on How Companies Can Shape the Future of Industrial Labor

12 **Driving Efficiency: Innovative Approaches to Mitigate the Labor Shortage**

Global Industrial Companies Look to Maximize Workforce Productivity

14 **Man Meets Machine**

Baird Capital's Industrial Solutions Team Explores the Advantages of Collaborative Robotics

The Great Skills Shift

The Forces Driving the Future of Industrial Labor

2019

GLOBAL INDUSTRIAL REPORT

A LETTER FROM JON LANGENFELD

Conventional wisdom suggests industrial labor is neither prestigious nor lucrative nor a viable career path – but Baird does not subscribe to this view. This supposed wisdom has actually given way to several increasingly urgent questions for global industrial companies. How will the industry respond to mounting labor shortages – and moreover, how will it cultivate the talent and skill sets needed for future growth?

Baird opened its doors in 1919 in the heart of the U.S. industrial belt. Since then, we've not only witnessed the growth of leading industrial companies – we've participated in their development, partnering with firms through market cycles and sector developments. As we celebrate our 100th anniversary, we reaffirm our commitment to the industrial sector and will continue to invest in the insights, capabilities and relationships our clients need to succeed in the evolving environment.

Our Global Industrial Conference, now in its 48th year, provides a unique forum for networking and discussion of the trends shaping the industrial sector. Our 2019 Global Industrial Report offers focused insights on the future of industrial labor and how industry companies are addressing the great skills shift.



Jon Langenfeld, CFA, is Baird's Head of Global Equities and Director of Research. He serves as part of the Baird Executive Committee and co-heads Baird's equity origination efforts. Prior to joining Baird in 2000, Jon was a senior manager at PricewaterhouseCoopers, providing supply-chain consulting services.



Institutional
Equities & Research



Global
Investment Banking



Baird Capital

Owning the Challenge

C-Suite Perspective on How Companies Can Shape the Future of Industrial Labor

Baird sat down with a panel of global industrial company executives to discuss the future of the industrial workforce amidst widespread labor shortages, a widening skills gap and a dearth of young workers. All agreed that these persistent challenges require innovative solutions.

MODERATED BY

JOSEPH GRABOWSKI
SENIOR RESEARCH ASSOCIATE, BAIRD



JOSEPH GRABOWSKI
SENIOR RESEARCH
ASSOCIATE
BAIRD



RICK CARON
EXECUTIVE VICE
PRESIDENT AND CHIEF
INNOVATION OFFICER
WELBILT



AARON JAGDFELD
PRESIDENT AND CHIEF
EXECUTIVE OFFICER
GENERAC POWER
SYSTEMS



CHRIS MAPES
CHAIRMAN, PRESIDENT
AND CHIEF EXECUTIVE
OFFICER
LINCOLN ELECTRIC



VICENTE REYNAL
CHIEF EXECUTIVE OFFICER
GARDNER DENVER

“We believe this is something every manufacturer needs to address aggressively... It’s something we’ll be dealing with as an industry for many, many years.”

The industrial sector is facing a labor crisis as it copes with various secular and cyclical challenges. How will industrial companies address today’s labor challenges, and what will they do to build the next generation of the industry’s workforce? This panel discussion explores how a variety of companies are tackling these important questions.

JOSEPH GRABOWSKI:

HOW IS YOUR BUSINESS ADAPTING TO CURRENT LABOR CONDITIONS? WHAT ROLE DO PROCESS AND TECHNOLOGY IMPROVEMENTS PLAY IN HOW YOU’RE ADDRESSING RELATED CHALLENGES?

CHRIS MAPES:

We’re positioning our business with the belief that this is a long-term strategic challenge. That this isn’t something that we can develop short-term solutions for which will eliminate the challenge. We believe this is something every manufacturer needs to address aggressively with various types of solutions. It’s something we’ll be dealing with as an industry for many, many years.

Lincoln Electric has had a very long-tenured history with education. In our headquarters in Cleveland, Ohio, we have the longest continuously running welding school in the world. It started operations in 1917. Over the past several years, we’ve worked to address and mitigate some of the challenges associated with education and the ongoing development of

individuals who can continue to advance our solutions into the global marketplace. We’ve expanded our investment in education considerably by expanding many in-house initiatives and developing a “earn to learn” type program.

AARON JAGDFELD:

It’s a really challenging labor environment, regardless of the roles that you’re trying to fill. We’re seeing shortages on the professional/technical side, particularly in engineering, as well as shortages on the manufacturing floor. We have some engineering operations in Germany and China that we’ve really started to expand because the labor pool for engineering talent is larger in those markets compared to the U.S. We have some of the same challenges when it comes to our in-house electronics, software and firmware development and coding teams. Those are difficult positions to recruit, especially in the Midwest. In those cases, we’ve taken to either outsourcing or hiring outside the U.S.

As far as our shop floor operations, we’ve really focused on continuous improvement and lean operations. If you’re not doing that as a manufacturing organization, you’re leaving a lot of money on the table. But when it comes to lean manufacturing, it’s not all about saving dollars as much as it is about taking time and labor out of processes. So while using lean techniques to continually optimize our operations is an important step, we’ve also had to pretty aggressively adjust our compensation structures. We’ve made significant changes in how we view the standard work day. The traditional eight-hour day doesn’t really exist anymore. We’ve become a lot more flexible with scheduling shifts because it allows us to tap into completely different labor pools.

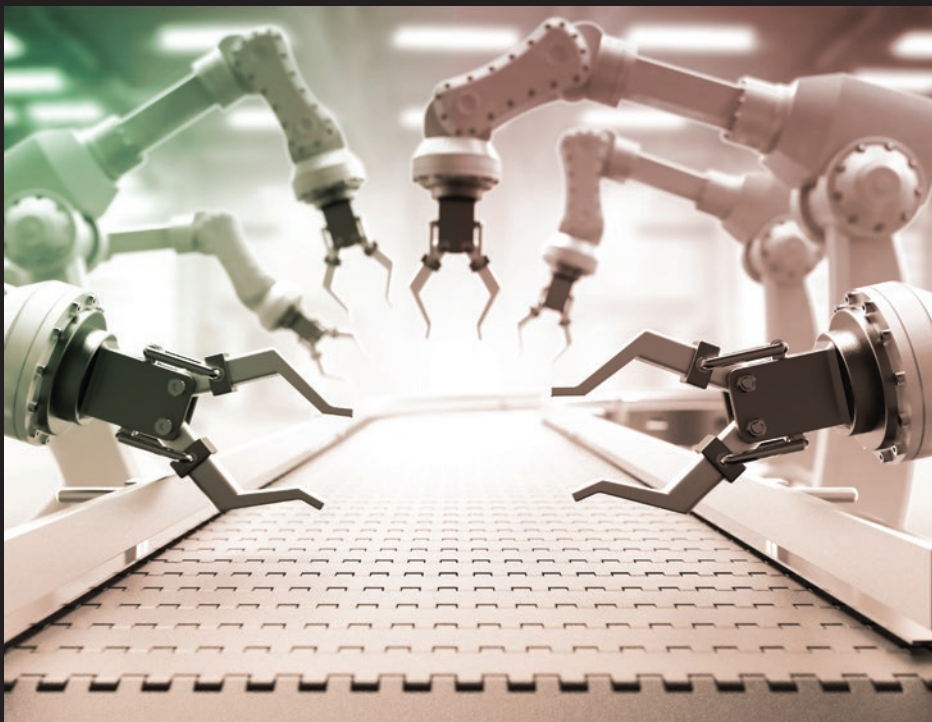
“ The skilled trades are suffering from both low unemployment and fewer people choosing trades as a career. This obviously presents a huge problem for us... That effectively puts a constraint on our growth. ”

VICENTE REYNAL:

We are approaching this issue from a couple angles. We believe in employee engagement and have done a lot of work around this by encouraging our employees to think and act like owners. This is why we awarded all 6,000+ of our employees with equity at the time of our IPO. We've also worked hard to create a highly engaged workforce and a spirit of continuous process improvement across the company. We continue to implement lean manufacturing initiatives across the company to eliminate non-value-added work and drive labor efficiencies.

RICK CARON:

Ten years ago, attracting young talent was a major concern in our industry (manufacturing of foodservice equipment), but that has changed. I think the thing that's drawn younger workers to the industry is the "new" consumer's interest in food, health and mobile devices. They're interested and paying attention. Thus, they like going into a kitchen and understanding how you build process knowledge around running that kitchen. They don't want to flip hamburgers, but they really like to understand exactly what makes that restaurant experience hum. We give our employees tools to excel. We have a lot of automation, which enables our employees to work smarter, not harder.



JOSEPH GRABOWSKI:

WHAT CYCLICAL AND SECULAR CHALLENGES ARE YOUR CUSTOMERS FACING REGARDING TODAY'S LABOR FORCE? WHAT OPPORTUNITIES AND CHALLENGES HAVE THESE ISSUES CREATED FOR YOUR ORGANIZATION?

VICENTE REYNAL:

Our customers are experiencing challenges around accessing skilled labor in key regions and industries. The opportunity this is creating for us is a chance to partner with our customers to help improve their efficiencies. For example, we recently did a lean event with a customer to help optimize their process in the field. This will allow us to be more entrenched with our customers while helping them become less dependent on skilled labor in this difficult environment.

AARON JAGDFELD:

Our channel partners are our dealers, who are typically electrical or HVAC contractors. They're a very large part of how we go to market. One of their biggest challenges right now is hiring new electricians or new plumbers. The skilled trades are suffering from both low unemployment and fewer people choosing trades as a career. This obviously presents a huge problem for us because this is the core of our distribution. Most of our products get installed permanently, so installation requires competent, skilled professionals. That effectively puts a constraint on our growth.

Consequently, we've been very focused on how to make our products differently so they're easier to connect to homes – making changes so it doesn't take two people eight hours to connect a generator to a house. How can we do it in half the time? If we can do that, then ostensibly, even with the current labor pool, we can accomplish twice as much. It's really about improving the bandwidth of what we have already, knowing that we're going to have these constraints. The macro thesis around these constraints isn't really going to change any time soon.

RICK CARON:

From our perspective, what's really interesting is the longer-term secular changes that are unfolding. It's clear we are facing a global labor shortage crisis. The cost of training and retaining employees are two other major challenges. Another big challenge is the rising cost of real estate. A big secular change for our customers is the pressure to get more output – to grow same-store sales in a smaller footprint with fewer employees.

JOSEPH GRABOWSKI:

CAN THE PUBLIC SECTOR HELP ADDRESS THESE CHALLENGES?

CHRIS MAPES:

This is a long-term problem, and as manufacturers, we've got to build solutions in the private sector. That's the way this is going to get resolved. I am passionate about developing skills and the work we do, and I just believe strongly that private-sector manufacturing – large industrial companies like Lincoln Electric and others – have to own this challenge. We need to continue to try to educate and develop the workforce that's going to ensure that manufacturing is a large component of our economy here for decades to come.



“ This is a long-term problem and as manufacturers, we’ve got to build solutions in the private sector. ”



AARON JAGDFELD:

Our education system celebrates college-bound tracks of learning. However, there are a lot of people for whom the right – or better – answer is a technical degree, skilled trade or other path that isn’t the traditional college track. In a way, the system overemphasizes college as the only viable path and does not reward students who select another path. I think it’s important to get back to supporting alternative career paths.

JOSEPH GRABOWSKI:

THE INDUSTRIAL SPACE HAS BEEN GRAPPLING WITH THE INTERNET OF THINGS (IOT) AND INCREASINGLY POTENT AUTOMATION SOLUTIONS. HOW WILL THESE FACTORS SHAPE THE FUTURE OF INDUSTRIAL LABOR? HOW ARE THEY CHANGING THE WAY YOU OR YOUR CUSTOMERS OPERATE?

CHRIS MAPES:

I think when our customers are confronted by labor constraints, there are two options. The first is identify and train the welder, which we can support through our educational programs. The second option is to automate the process. Automation generally provides an opportunity to increase productivity or quality. Competency is relative to that, depending upon the complexity of the application. It doesn’t necessarily mean eliminating headcount. It could be that the welder becomes a technologist or does other process

work within the cell. Perhaps they become the robotics expert who is then doing the service work in the manufacturing facility. We really don’t advocate automation as a way to eliminate headcount. It’s about repurposing headcount into other skills, and we believe it can drive much higher productivity, consistency and quality, especially in complex welding applications.



AARON JAGDFELD:

From an internal perspective, where IoT becomes important is when we link automation – say, a robot – to the movement of the line. That goes beyond just automating operations. It's integrating the manufacturing floor. IoT is also very helpful in predictive analytics. We're constantly monitoring processes and products for predictive failure. Failures generate downtime, and downtime in any manufacturing operation is not good. We use IoT internally to predict those failures before they happen. It's similar on the external side. We use IoT to integrate sensors into our emergency backup generators. It's not enough to simply put sensors into the machines; you need to build a connectivity layer to get the data from the sensors to the people who need it, whether it's the machine operator, our dealer or Generac. However, you need to go a step past

building that sensor-person pathway. You need to build logic around the sensor and create algorithms around what the sensors are doing.

As a manufacturer, we're now tackling challenges like building software, writing algorithms, deciding how often to ping a sensor and finally analyzing the data. It's fascinating, and it's a whole different skill set that gives rise to new roles, new opportunities and new challenges.

RICK CARON:

I speak quite a bit around the world on the future of our appliances. What I often say is, if you're buying equipment today, and it doesn't have connectivity, it's going to be a dinosaur tomorrow because in order for the equipment to play

“ We absolutely have an industry leadership responsibility to drive education and training around our workforce. ”

in this new world, it needs to respond to some type of kitchen management system. All of the back-of-the-house equipment in a restaurant – that is, the kitchen – has an open loop. It's never been tied into the front of the house with digital technology. With connectivity, it will. It will lead to production schedules that go directly to the equipment so the equipment knows what to do. At the end of the day, the kitchen and the restaurant need a brain, and we call that the kitchen management system. It's basically a production control system for the kitchen, applying what we apply in our factories but to a much smaller enterprise like the kitchen, which is really a small factory in itself.

As for automation, I see it being invisible inside the restaurant. Our appliances are already being “born” digital, and we have retrofit devices that can be added to existing appliances. That said, I believe our future fryers and grills will have material handling that automatically moves product through the appliance. But to do that, the packaging needs to change. Automation is leading to more clever design where packaging and feeding of the food product occurs naturally into the appliances themselves. Consequently, our business is getting more tied into the packaging supply chain. That packaging also needs to be recyclable and good for the environment.

JOSEPH GRABOWSKI:

HOW ARE YOUR COMPANIES WORKING TO MAKE EQUIPMENT MORE USER-FRIENDLY AND QUICKER TO TRAIN?

CHRIS MAPES:

This is an element of how we think about our next generation of products and welding technologies we'll bring to the marketplace. We need to make welding cutting solutions simpler and need to make processes easier for both the welder and fabricator. It's important to make it easier for today's welder, knowing they might not have the level of skills as welders in previous generations.

For the welder, we need to make sure that the user interfaces make key competencies and performance information very accessible. We need to make it a one-touch setup for any particular application. Let's make it easier for the welder, recognizing that the welder might not have the level of skills that the generational welder before had. We also want to make it easier for the fabricator. A fabricator may have multiple welders within their business, so that's where we want to set up systems and solutions to better enable them to measure and enhance the welding processes.

Of course, training also makes a difference here. We've made a huge investment in training to educate welders and bring them up to speed as quickly as possible. Our VRTEX Training Solution is a virtual reality trainer, which you can find in a multitude of countries and educational institutions not only in the United States but around the world. We've also placed those units inside a large semitrailer that travels the U.S. in the summer, going to state fairs and the National FFA Show and other events to expose people to welding.

RICK CARON:

People no longer read the owner's manual to operate equipment. Forget all that. It has to be as easy to use as an iPhone, particularly for younger workers. They have to be able to literally turn the equipment on, and it needs to be intuitive on what to do next. The second piece is a bigger user interface. People sometimes think the user interface is just the screen. It's not – it's the whole appliance.

It's really about getting the information to people using the machine in a very intuitive way. It's tied to when they need the information as they do their job. You test to that when you're developing and launching the equipment. Now that we're getting systems of equipment together, we're also working to ensure the styling and the physical appearance of the equipment comes across as one family across our complete product line.

JOSEPH GRABOWSKI:

HOW ARE YOUR COMPANIES ADAPTING THEIR APPROACH TO ATTRACTING, TRAINING AND RETAINING YOUNGER TALENT?

RICK CARON:

We're lucky that young workers have returned to our industry over the past few years. In addition to giving them technology and tools to excel in their jobs, they enjoy working for brands they know. The customers/brands we interact with are truly global, and they're everywhere. It's a connection point for employees to come into the world of those brands by working inside a Welbilt factory making equipment for those brands.

VICENTE REYNAL:

We're finding success in attracting younger generations, at all levels and functions through a concerted effort around engagement and talent development. We like to best describe our culture as one where Gardner Denver is a 160-year-old startup. We have a very entrepreneurial spirit and focus on agility and fast decision-making. We also have a highly

connected workforce. Today, approximately 30% of our employees are millennials, and our engagement scores on this segment of the employee base are higher than the total company average. We have a few programs we're using to target younger generations of workers, like a high-potential program, a "pay for performance" initiative, with equity at more junior positions, and new initiatives that pull in cross-functional talent from all levels of the organization to solve business challenges.

CHRIS MAPES:

We need to underscore why manufacturing is a great place to have a career. Manufacturing comprises a little over 12 million workers in the United States. That's about 8.5% of the national workforce. The National Association of Manufacturers reports that in 2017 that average wage was more than \$84,000 a year. That is a very sustainable livelihood, and we think manufacturing provides that.

We absolutely have an industry leadership responsibility to drive education and training around our workforce. I also believe we have an obligation in our local communities to be



“ In a way, industrial manufacturers have created our own problem... How do we fix it? It's not an easy answer. ”



a manufacturer who's willing to work to expose individuals to the value of manufacturing and welding. Lincoln Electric does that through a host of various programs.

One simple example is in 2012, we worked with the American Welding Society to develop a welding merit badge for the Boy Scouts. Exposing kids to welding is one of the steps. We also have partnerships and programs that expose high school, early college and early career individuals to our company and our industry. It all helps to expand the visibility and scope of both manufacturing and Lincoln Electric to people who might not

recognize that it can be a great career path. We're also proud to support organizations like Skills USA and World Skills, which provide programming for young adults to be active in trades.

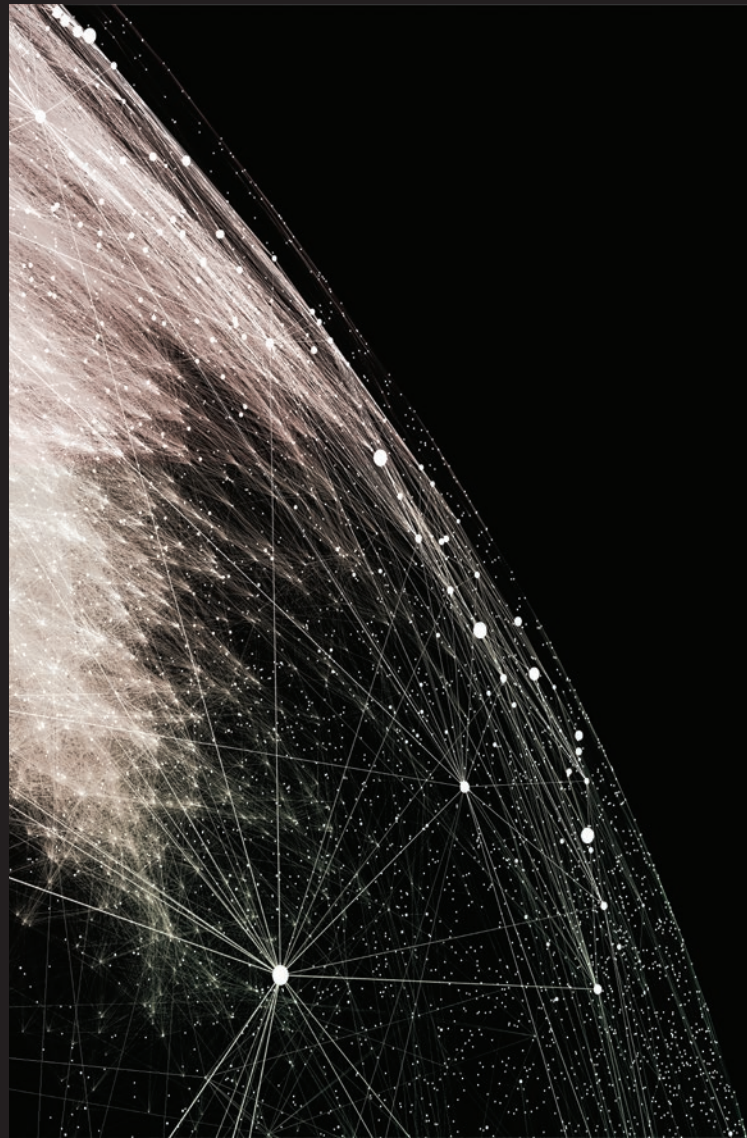
AARON JAGDFELD:

In a way, industrial manufacturers have created our own problem. As an industry, we've failed to groom the next generation of potential employees for our operations. As an industry, over the last 10 years we've woken up to the fact that this is going to be a major problem. How do we fix it? It's not an easy answer. There's not a single silver bullet.

It's so important to work on programs to introduce kids to manufacturing at an earlier age. We need to reach them when they're in high school or even earlier to encourage them to get interested in the STEM subjects, robotics and automation. We need kids to be interested in those disciplines so we've got a viable workforce for the long term.

We also want to make a difference in addressing the issue of providing alternative career paths for students who need or want one. We have a partnership with an organization called GPS Education Partners. It's something we started almost 20 years ago for credit-deficient high school students who otherwise may not graduate. We identify students and offer them the opportunity to learn in a classroom setting, in our plant, and also work on the shop floor. It's kind of a hybrid job, where they work for the company but also attend school for several hours a day. They build up credits to get back to basically an equivalency degree, and they actually get to graduate with their class. It's an accredited program, and there are actual teachers on site at these businesses that enroll in the GPS program.

That's just one program, and it's going to take a lot of programs like that to turn the tide on this labor trend. The world is changing incredibly fast, and the talent that we need and that's needed by manufacturers in the U.S. has to change with it. We've got to get back to basics and bolster technical training and technical education. We need to continue to create innovative programs and have to explore new ways of finding people to recruit to our workforce. ■



“ The world is changing incredibly fast, and the talent that we need and that's needed by manufacturers in the U.S. has to change with it. ”



Institutional
Equities & Research



Global
Investment Banking



Baird Capital

Driving Efficiency: Innovative Approaches to Mitigate the Labor Shortage

Global Industrial Companies Look to Maximize Workforce Productivity

AUTHORS

JOEL COHEN

MANAGING DIRECTOR CO-HEAD,
BAIRD GLOBAL INDUSTRIAL
INVESTMENT BANKING

JOE PACKEE

MANAGING DIRECTOR CO-HEAD,
BAIRD GLOBAL INDUSTRIAL
INVESTMENT BANKING

With the global economy still pushing forward and unemployment rates in many countries at record lows, recruiting qualified workers has become increasingly difficult for industrial companies. As a result, manufacturers across the globe are implementing innovative strategies to increase operational efficiency and maximize productivity from their existing workforce.

OPERATIONAL EFFICIENCY: INCREASING EMPLOYEE PRODUCTIVITY

Industrial companies, large and small, are simplifying their business models to focus on their core competencies. Conglomerates, such as GE and Honeywell, are divesting or spinning off divisions to create portfolio clarity. Some companies are taking manufacturing activities that were

historically completed in-house and outsourcing to specialist subcontractors. Others are leveraging a global supply chain and increasingly sourcing from low-cost countries. No matter the size or strategy, the common theme amongst industrial companies is a focus on operational efficiency.

In markets such as North America, Europe and Japan, where skilled labor is a scarce and expensive resource, efficiency is driven by how that labor force is used. Many companies explore automation, which has led to much debate in recent years about whether the use of industrial robots will eliminate jobs or simply increase employee productivity. As the cost of industrial robots continues to decline, manufacturers are adding more robots and advanced machinery to their production lines to further increase operational efficiency and productivity.



AUTOMATION: THE INCREASING USE OF INDUSTRIAL ROBOTS

It is no coincidence that the countries with the highest density of robots, such as Japan, Germany and South Korea, are also countries with relatively low unemployment rates. The use of robots and digitalization frees up humans to focus on more creative tasks, generating higher-skilled and better-paying jobs while also transforming “traditional” manufacturers into innovative “industrial technology” companies. While penetration rates are highest in developed economies, wage rates in countries like China are growing rapidly, and enterprises are focusing heavily on increasing automation.

Beyond operational efficiency, companies are also adopting robots to meet finer manufacturing tolerances and reach higher levels of consistency. Automation systems and robotics are therefore being heavily deployed in markets such as automotive, aerospace, agriculture, warehousing and logistics. With some form of economic downturn or slowdown likely in the medium term, companies that can manage the productivity of their employees through economic cycles will stand to gain the most from investments in automation.

UNFILLED VACANCIES: RECRUITING & TRAINING THE RIGHT PEOPLE

High employment levels and key-skills shortages are making it difficult for industrial companies to recruit the right talent. This global “war for talent” is making companies more aware of the high cost to recruit, acquire and retain talent in their organizations. As a result, industrial companies are supporting

the training of graduates or re-skilling the unemployed to better manage the skillsets within their different departments, from R&D to assembly.

In some cases, the labor shortage is so great that industrial companies are unable to fulfill production demand and deliver their solutions on-time to customers. At the beginning of 2018, there were over a million job vacancies in Germany, and it took 100 days on average to fill an available post, a 40-day increase from the year before. Companies from Siemens and BASF to those in the Mittelstand have been actively looking for engineers, software developers, electricians and skilled welders, all roles that cannot be filled by robots.

FIT FOR PURPOSE: APPLICATION ENGINEERING

In a competitive global economy, the companies that succeed provide solutions, not just products. Western-based manufacturers are often competing against newer emerging-market competitors on a combination of technology and price. Having the best product on the market does not always resonate with clients that are focused on cost.

A trend that has permeated through industrial companies since the economic downturn has been to “engineer cost out” of the manufacturing process. For example, engineers are redesigning or “modularizing” solutions for specific applications rather than having a one-size-fits-all approach, where many of the products are then “over-engineered”. Over-engineering products increases the cost for the manufacturer as well as the price paid by the customer.



Institutional
Equities & Research



Global
Investment Banking



Baird Capital

Man Meets Machine

Baird Capital's Industrial Solutions Team Explores the Advantages of Collaborative Robotics

AUTHORS

JAMES BENFIELD
PARTNER
BAIRD CAPITAL

ANDREW DYER
INVESTMENT DIRECTOR
BAIRD CAPITAL

Collaborative Robotics ("Cobots") is a new generation of lightweight, flexible and mobile robots capable of safely working alongside workers within production and distribution environments. The transition to more modular and flexible manufacturing environments that meet the increasing demand for customization, combined with advances in low-cost technology, is helping to usher in this new era of robotics.

Generally speaking, collaborative robots are mobile systems capable of sharing a workspace, collaborating and cooperating (via some physical contact) with humans. Industry leaders Rethink Robotics introduced the term "collaborative" and pioneered this new class of robot with the launch of the Baxter Cobot in 2012. Since then, companies like ABB, Fanuc and Universal Industries have entered the arena with their own collaborative models.

Current technology focuses on sequential collaboration, or robots and humans working separately to complete each step of a production process. Emerging designs are capable of simultaneous collaboration, or two parties performing separate tasks in a shared workspace at the same time. Designers are now targeting supportive collaboration, where robots and humans work simultaneously on the same task. However, this technology is a few years away from industrialization.

Typical applications of collaborative robots include pick-and-place, line loading, material handling and machine tending. Most suitable applications involve the repetitive movement of lightweight parts and take place in close proximity to humans.

Collaborative robots offer many advantages over traditional industrial robots:

- They are designed to be safe around humans through force-limiting technology, pausing in response to contact or proximity sensors that detect the presence of human workers.

- Unlike the large robot systems favored by the automotive industry, they are compact, lightweight and can be moved around a factory or distribution center.
- They are comparable to smartphones or tablets in their user-friendliness and can be reconfigured for different tasks and activities.
- The focus on software versus bespoke hardware, ease of setup and programming and increased flexibility should make collaborative robots cheaper to purchase and maintain than traditional industrial robotics.

In addition to implementation, adaptability and cost benefits, collaborative robots are expected to drive productivity by combining the power and precision of robots with the creativity and problem-solving ability of humans. This refutes common concerns around automation displacing human jobs and promotes a more favorable economic outcome where robots elevate the contribution and value of the human role.

Anecdotes from electronics companies that have already adopted the technology are largely supportive of this theory. For example, a study by MIT researchers on BMW's production lines showed teams consisting of humans and machines are more productive and less idle than teams consisting of only humans or machines. At Continental's Texas manufacturing facility, the implementation of collaborative robots boosted the value-added nature of the team's activities and enhanced their technical capabilities. It also deterred the movement of operations to lower-cost locations. At Paradigm Electronics, a manufacturer of high-end speakers and AV components, the

addition of collaborative robots has increased throughput by 50%.¹ Other success stories include Johnson & Johnson, Harley Davidson, Trelleborg and Volkswagen.

Health benefits are an additional draw. For instance, Audi AG's recent deployment of collaborative robots as part of its PART4you initiative at its main factory in Germany is helping to reduce potential back problems among its employees by eliminating the need to reach over long distances or bend down repeatedly.

With such positive feedback from early adopters, it's easy to see why many are saying collaborative robots are here to stay. Estimates assume 80% growth per annum over four years, taking the value of the market from less than \$100 million in 2015 to more than \$1 billion in 2020, with volumes expected to rise from ~3,000 units to 40,000 over the same period.²

The thrust of initial demand is expected to arise from the consumer electronics industry, particularly from manufacturers engaged in small parts assembly activities. In addition, it is expected that given the lower cost and clear benefits of the technology, a large portion of the growth will be driven by small- and medium-sized manufacturing companies.

BAIRD CAPITAL'S INVESTMENT APPROACH

At Baird Capital, we are seeking investments in high-quality businesses that are benefiting from the growth in industrial automation. With our global capabilities and deep sector experience, we believe that we are well-positioned to help differentiated and growing companies in the sector, particularly those with international ambitions.

¹SCM World – "Collaborative Robotics and the Evolution of the Species". Available at: scmworld.com/collaborative-robotics-evolution-species

²Robotics.org – "Collaborative Robots and Safety Hand in Hand". Available at: robotics.org/content-detail.cfm/industrial-robotics-industry-insights/collaborative-robots-and-safety-hand-in-hand/content_id/6198



BAIRD'S GLOBAL INDUSTRIAL CONFERENCE

For nearly 50 years, Baird's Global Industrial Conference has connected senior executives with current shareholders, future investors and industry decision-makers.

Making Connections, Creating Opportunities

One of the leading events of its kind in the United States, Baird's Global Industrial Conference features C-level presenters from prominent global industrial companies, providing a unique opportunity to connect with key players in the industrial and energy sectors. Presenting executives share market insights with attending institutional and private equity investors, portfolio managers and buy-side analysts via fireside chats, formal presentations, and 1–1 and small group meetings.

**FOR INFORMATION ON BAIRD'S
OTHER INVESTOR CONFERENCES,
VISIT [BAIRDCONFERENCES.COM](https://www.bairdconferences.com).**



BACKED BY BAIRD'S PREMIER INDUSTRIAL PLATFORM

No. **1**

Baird ranked No. 1 for overall quality in sales, corporate access and research and earned an additional nine No. 1 rankings in Greenwich Associates' 2018 survey of institutional fund managers.¹



Baird's sales and trading professionals make a market in more than 3,600 stocks and trade in markets across the globe.

Since 2012, our Global Investment Banking team has completed nearly 430 advisory transactions, representing more than \$113 billion in transaction value and 518 financings raising more than \$135 billion.

\$3.4
billion

Baird Capital's investment and operating professionals in the United States, Europe and Asia have raised \$3.4 billion in private equity and venture capital and invested in more than 300 portfolio companies.

**TO LEARN MORE ABOUT BAIRD'S COMPREHENSIVE GLOBAL INDUSTRIAL PLATFORM,
VISIT INDUSTRIAL.RWBAIRD.COM**

Jon Langenfeld, CFA
Head of Global Equities
Director of Research

Dan Renouard, CFA
Co-Head of Global Equities
Director of Distribution

Jennifer Grayson
Head of Global Corporate Access

Patrick Spencer
Vice Chairman
Institutional Equities, Europe

Steve Holt
Head of International Equity Sales

Joel Cohen
Co-Head of Global Industrial
Investment Banking

Joe Packee
Co-Head of Global Industrial
Investment Banking

James Benfield
Partner, Baird Capital

Andrew Brickman
Partner, Baird Capital

Brett Tucker
Partner, Baird Capital

Andrew Tse
Partner, Baird Capital



IMAGINE WHERE WE CAN GO TOGETHER

To learn more about Baird's Global Industrial platform:

Call: 800-79-BAIRD (800-792-2473)

Visit: industrial.rwbaird.com

Follow: [@rwbaird](https://twitter.com/rwbaird)

¹Greenwich Associates North American Equity Investors – U.S. Small-/Mid-Cap Funds and U.S. Equities Sales, Corporate Access & Research, May 2018. Surveys conducted with 110 small-cap and mid-cap fund managers and 194 fund managers and 275 traders, respectively. Rankings for qualitative metrics based on leading research firms in surveys.