

2015

Global Industrial Report

BAIRD

Examining trends
and dynamics that will
shape the world



An aerial, high-angle photograph of a city, likely London, showing a dense network of streets and buildings. A large river, the River Thames, flows through the center of the city. Several tall, modern skyscrapers are visible on the right side of the river. The overall color palette is dark and monochromatic, with shades of grey and black.

CONTENTS

2 / **The New
Industrial Revolution**

8 / **Technology in the
Industrial Economy**

10 / **Grow and
Thrive**

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 Pricewaterhouse Coopers, providing supply chain consulting services.

Why Baird's Perspectives Matter

2015 GLOBAL INDUSTRIAL REPORT

A LETTER FROM JON LANGENFELD

For 45 years, Baird's annual Industrial Conference has been successful by many measures – from growing attendance to broadening end-market representation to globalization of content. This success is rooted in both the history of our firm and our ability to expand our expertise alongside the evolution of the sector.

Our Industrial sector expertise is a natural extension of our 1919 origins as a Midwest-centric financial firm, headquartered in the center of the U.S. Industrial Belt. The globalization of the industrial supply chain over time provided us with a unique opportunity to broaden both our geographic presence and expertise. Similarly, the technology that enabled globalization and increased industrial innovation helped Baird expand our end-market exposure and further globalize our perspectives and relationships.

This co-evolution continues today, making our Industrial Conference as relevant as ever. Conference attendees appreciate the insights from Baird's dedicated research analysts as well as senior executives from leading industrial companies. These views complement perspectives from our investment and operating professionals around the world to present a comprehensive picture of this rapidly changing sector, and this is the rich context we've attempted to capture in this 2015 Global Industrial Report.



Jon A. Langenfeld



Institutional
Equities & Research



Global
Investment Banking



Baird Capital

The New Industrial Revolution

Executives discuss the implications of “Industry 4.0” for their enterprises

To discuss this dawning revolution—commonly referred to as “Industry 4.0”—and its diverse implications, Baird convened a panel of senior executives from industrial companies around the world.

MODERATED BY
ALLEN ROOT

The relationship between industry and technology is constantly evolving. Yet there are specific points in history that represent quantum leaps forward in terms of productivity and efficiency. First, production was mechanized using water and steam power. Then electricity enabled greater mass production. More recently, electronics allowed vastly increased automation of processes. Now the proliferation of sophisticated technologies is generating a constant stream of data that holds tremendous potential.



ALLEN ROOT
VICE PRESIDENT
DESK SECTOR STRATEGIST
BAIRD



SUJEET CHAND
SENIOR VICE PRESIDENT
CHIEF TECHNOLOGY OFFICER
ROCKWELL AUTOMATION



CHRIS COLE
CEO
INTELLIGRATED



RENO SUFFI
DIRECTOR OF
BUSINESS DEVELOPMENT
OMRON



ROB WILLETT
PRESIDENT
CEO
COGNEX

“ We live in a largely connected world where people think of something and they do it, or they want something and get it instantaneously. This mindset is driving the need for changes in manufacturing. ”

AUGUST 2015

ROOT {BAIRD}

What specific technologies are moving the needle on Industry 4.0 and where might this trend be taking us?

CHAND {ROCKWELL AUTOMATION}

The new industrial revolution is about extracting real value from large volumes of data that are inherent in every part of the manufacturing and industrial enterprise. When we think about smart manufacturing or the connected enterprise, we typically think of five technologies that are foundational: a secure network infrastructure; a multidiscipline control and information platform; scalable, high-power computing resources; information management and analytics; and mobility with modern human-machine interface technologies.

SUFFI {OMRON}

It's ultimately about the pursuit of greater efficiency – the integration of man and machine with underlying constant data analysis. The part that's truly intriguing is taking data analytics and translating them into the mobility element through enterprise software, improving the logistics and fueling your supply chain requirements. This feeds into autonomous robotics and predictive safety systems.

From a penetration standpoint, I think we're still relatively in our infancy. The market is enormous, and penetration of advanced

industrial automation equipment is probably somewhere between 15 and 30% with projected double-digit growth over the next five to ten years. It's truly a massive opportunity.

WILLETT {COGNEX}

This question really gets at the overall potential for automation technologies and what full penetration might look like. I think ultimately we can envision a lights-out manufacturing facility or an operator-free environment as indicating full adoption. We see machine vision as a key enabling technology.

In the markets served by Cognex, we see automotive and semiconductor manufacture as perhaps further down the road of adoption. But even so they are still less than 25% penetrated. At the other end of the spectrum, the consumer electronics market literally has hundreds of thousands of people involved in executing basic assembly tasks by hand that in the long run will be done better when automated with machine vision and robotics. That market might have less than 5% penetration of the kind of technologies we're talking about.

ROOT {BAIRD}

What is driving the adoption of these technologies and what benefits are companies seeing?

CHAND {ROCKWELL AUTOMATION}

From our perspective, the two most important drivers are productivity and global competitiveness. These can translate into lower cost of production, faster time to market, improving asset uptime and managing enterprise risks.

“ Ultimately we can envision a lights-out manufacturing facility or an operator-free environment as indicating full adoption. We see machine vision as a key enabling technology. ”



From my standpoint, I think it's home delivery that's pushing all that flexibility. Amazon Prime and others have pushed the world to same-day or next-day delivery as the expectation. And whether you're delivering groceries or consumer products, suppliers must cope with the demands of building infrastructure to accommodate rapid delivery.

I would tell you that I see our customers making investments less because of the cost of labor, but more for the need for flexibility and time required to train labor or deal with turnover. It's better to automate and optimize processes that can handle that up-and-down flexibility. If you've got the process right, you can do it with fewer people.

ROOT {BAIRD}

What are some of the challenges to adoption and how are they being addressed?

WILLETT {COGNEX}

Data security is certainly a potential barrier to adoption. Today, the vast majority of our customers connect our vision and ID products to automation controllers, which then connect to ERP systems. In this sort of traditional closed-network factory environment, their existing security systems work well. But the real value of Industry 4.0 is the adoption of Internet-connected devices across dispersed manufacturing locations. This is inherently more complex from a security standpoint, and that is holding up adoption.

SUFFI {OMRON}

We're seeing the same things. And the concern is that, as Industry 4.0 moves toward the truly connected enterprise, it opens up more threats of opportunity. Right now there are some standard protocols for cryptography in development, and you'll probably see that more and more embedded into the

SUFFI {OMRON}

Competitiveness is certainly a key driver. There's a desire to have real-time insight into your business and the ability to apply the necessary measures to enact the required changes. However, I wouldn't necessarily point to cost as a universal driver for companies to pursue new technologies and solutions. Over time technology advances and the cost goes down.

For us, the core drivers are changes in customer expectations and behaviors. We live in a largely connected world where people think of something and they do it, or they want something and get it instantaneously. This mindset is driving the need for changes in manufacturing.

COLE {INTELLIGRATED}

It's all about flexibility and the ability to scale up or down very quickly in a very rapidly changing environment.

devices themselves as the processing power within the devices themselves becomes more robust over time to handle such algorithms. Still, I would say it's in its infancy, so customers are still approaching it in more or less the traditional way.

COLE {INTELLIGRATED}

This is definitely a growing concern for our large, multinational clients. These are the big retailers and Internet companies of the world, and they're frequently convinced that they are going to be targeted by hackers. So they're extremely vigilant, yet they still need to remain connected. And that can present challenges.

For example, when working within a company's carefully established security guidelines, you might find that the company's own subsidiaries – particularly those that operate in other parts of the world – don't always necessarily follow those guidelines. And there's a risk to suppliers of getting caught in the middle. We just have to be very careful about what we deliver to customers, and work to ensure that plays very well into their network security efforts.

CHAND {ROCKWELL AUTOMATION}

I think the best approach to security is defense in depth, which is really building layered security solutions and utilizing reference architectures for implementing end-to-end security.

Security is a constantly moving target. For the security solutions that are implemented today, we have to build in the ability to continually update those solutions so we can maintain a desired level of resiliency and confidence for manufacturing companies to secure their manufacturing operations and their enterprise.

I don't believe it's necessarily more of a barrier to adoption than it is for the day-to-day business you and I do electronically. Whether it's email or banking or shopping, security is an issue for all these different types of operations that we do over the Internet every day. It's no different in the manufacturing world, and I don't think the

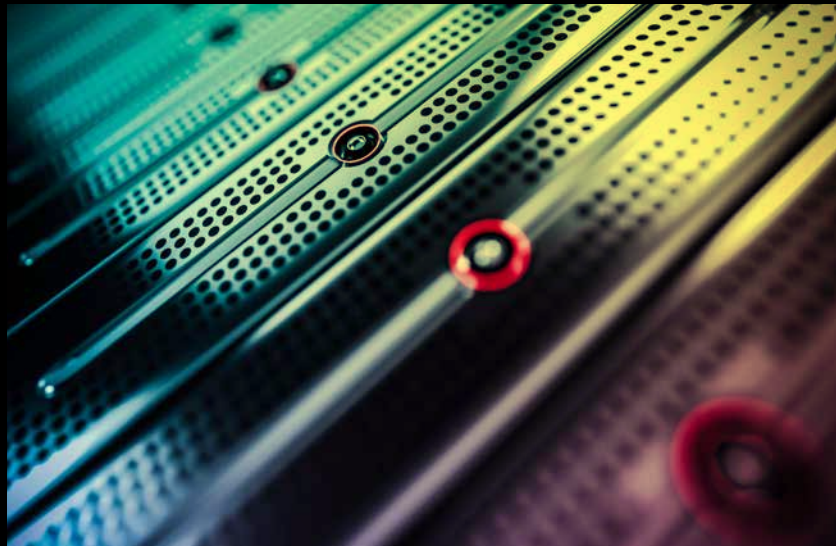
threat is going to keep the manufacturing community, the production environments, from adopting modern technologies. But it is an issue that needs to be addressed.

WILLETT {COGNEX}

Another barrier we've encountered is a shortage of qualified engineering resources at manufacturers that can successfully deploy technology, particularly in markets that need to scale production very quickly. There are projects that our larger customers in fields such as consumer electronics or logistics would like to do, but available engineering resources make it difficult or impossible to hit desired timeframes.

COLE {INTELLIGRATED}

We're also seeing a lack of people in industrial and manufacturing engineering departments who have the available bandwidth to manage these projects. Once they commit, it becomes an issue of training, but in our software world the engagement of the customer – and their ability to get engaged and help train their own people to effectively own the software – can tell you a lot about how successful a project is going to be.



“ I see our customers making investments less because of the cost of labor, but more for the need for flexibility and time required to train labor or deal with turnover. ”

“ I think manufacturing will change more in the next ten years than in the past fifty due to the rapid evolution of information and communication technologies. ”

It's worth mentioning that lead times are shortening as well. We already talked about the global move to a rapid delivery model and how that's changing our customers' worlds. Many

WILLETT {COGNEX}

There is enormous untapped demand for this technology. In developed markets, opportunities relate to reducing labor costs and improving product quality, which are huge. There's even more opportunity in evolving markets, where companies have traditionally built manufacturing organizations around a low-cost, high-volume model, and now need to raise their quality in order to be globally competitive. In these markets, opportunities are related to error proofing, improving through-put and also, as strange as it sounds, addressing labor shortages. More engineering resources would accelerate the ability of companies to take advantage of the inherent potential of these new technologies. Generally, we only see high levels of engineering capability today in very advanced industries, such as consumer electronics, automotive, and to a certain degree, logistics.

COLE {INTELLIGRATED}

To me, it's a continuum of putting the power of the microprocessor to work on the shop or distribution center floor. A generation ago, we were automating what people could do. Then we got to the point where we're automating well beyond what an individual can do and now we're getting to the whole next generation of where that's headed.

In our world, it's more of a question of how you can efficiently distribute finished products and get them to the right place. We're about using all that data analytics and sensing and capability to be able to get to the volumes you need to get to very quickly and very accurately.

The big driver for us is accuracy. You have to have 100% accuracy all the time. Frankly, that often means removing people from the process, developing vision systems, leveraging software, using bar coding. It's a drive to get rid of all errors because if you ship those errors out, the cost is just horrendous.

have competing investments they've made in different technologies or different ways of doing things that they're looking at, but they are all requiring the suppliers of automation to dramatically cut their delivery and implementation times. Customer preferences also shift very fast, so there's a lot more mass customization than ever before.

ROOT {BAIRD}

What do you see as the next "big things" that could push this evolution further, faster?





SUFFI {OMRON}

There's another element to this, albeit a more intangible one: Many companies have a great interest in reducing their liability or reducing their risk. Food and drug safety and security companies are a great example. But the benefits – how do you measure them? Minimization of impact to brand equity, overall cost, the cost of a recall, the impact of a recall and the savings associated with avoiding one. Those are huge potential cost savings opportunities that really speak to the importance of risk mitigation going forward.

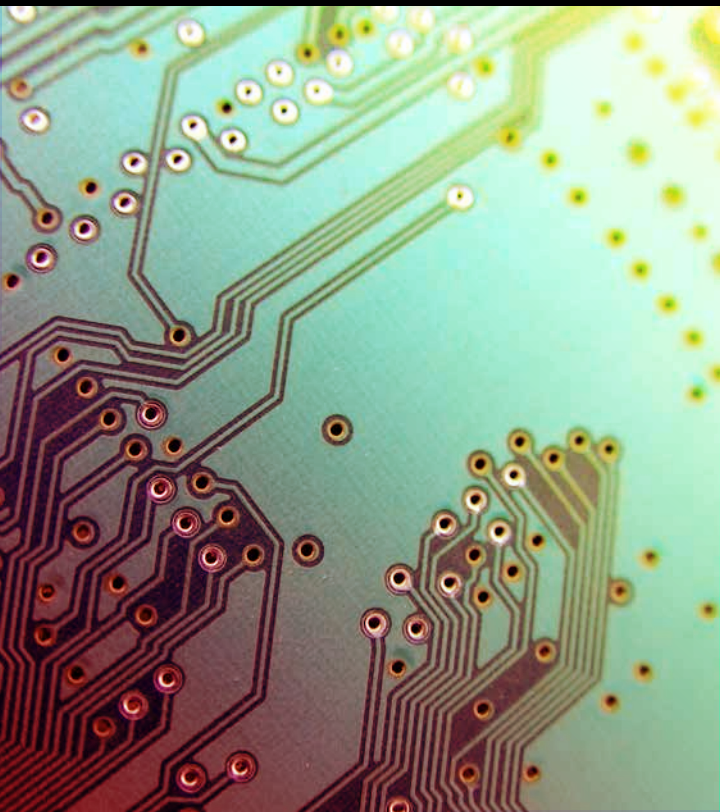
I also see the processing power of microchips growing exponentially and driving the adoption of Industry 4.0. The emerging technologies really are going to be focused in the software, the enterprise software, the analytics capability, taking all this massive data from the smart connected devices, converting it, transforming it into the knowledge and then the ability to make decisions.

We talk about taking an intelligent platform from a reasoning standpoint, being able to make adaptive decisions, embedding that technology into autonomous devices, converting the decision capabilities of this analytics software into the physical manifestation, whether it be through collaborative robotics as everyone's talking about most recently or if it's autonomous self-guided vehicles, and empowering them with so-called autonomous decision-making that's collaborative in the environment, in the production environment. It's really an exciting time to be part of the industry. It's a great time to be in this market and we're really looking forward to what's next.

CHAND {ROCKWELL AUTOMATION}

I think manufacturing will change more in the next ten years than in the past fifty due to the rapid evolution of information and communication technologies. Robotics, new materials, advanced analytics and optimization algorithms, learning systems, micro grids, modeling and simulation, and high-performance computing – these are just a few examples of technologies that will transform manufacturing in the next decade.

I agree that this is a great time to be in automation and manufacturing. I'm really excited about the future because the rapid technology evolution is accelerating the connected enterprise and the transformation of manufacturing to yield unprecedented benefits in productivity and global competitiveness in the next five to ten years. ■





Institutional
Equities & Research



Global
Investment Banking



Baird Capital

Technology in the Industrial Economy

Strong demand for acquisitions but critical diligence needed to ensure long-term value

AUTHORS

JOEL COHEN
MANAGING DIRECTOR
DEPUTY HEAD
BAIRD GLOBAL
INDUSTRIAL
INVESTMENT BANKING

JOE PACKEE
MANAGING DIRECTOR
DEPUTY HEAD
BAIRD GLOBAL
INDUSTRIAL
INVESTMENT BANKING

Industrial companies' thirst for access to and implementation of new, innovative technologies is a core driver of current merger and acquisition activity. In a stagnant global growth environment, companies in virtually every market are looking for ways to gain competitive advantages and enhance profitability. Whether it's producing rapid 3-D prototypes, enhancing workflow on a production line, optimizing movement of products in a warehouse or remotely monitoring and controlling inputs on a farm or in a refinery, technology can drive huge productivity gains.

While the opportunities are significant, many technology-rich companies, still in the early stages of adopting new solutions in rapidly evolving markets, command high valuations relative to current earnings. Buyers need to ask the right questions to ensure they capture appropriate risk-adjusted long-term value for their investment.

DRIVE FOR QUALITY, EFFICIENCY AND SPEED TO MARKET

Virtually every end market is facing tremendous demands from customers to deliver products and services faster and with higher quality. Rapid innovation is creating the need to refresh products on timelines never seen before in order to

preserve market share. Costs, including global labor rates, are increasing to unprecedented levels. In addition, the increasingly stringent global regulatory environment is driving the need for various technologies that enable companies to remain compliant while remaining profitable.

In order to secure the right technologies, companies are investing heavily in R&D but also increasingly turning to acquisitions. Target companies that focus on delivering enabling technology to a given vertical market or niche can be very successful in understanding customer needs and developing value-added solutions. Leveraging these core competencies in a larger company with global channel access and strong brands

can provide significant acceleration in adoption. This can make acquisitions an attractive alternative to internal technology development.

Some examples of companies that, through careful consideration and diligence, pursued acquisitions that provided highly leveragable technology include:

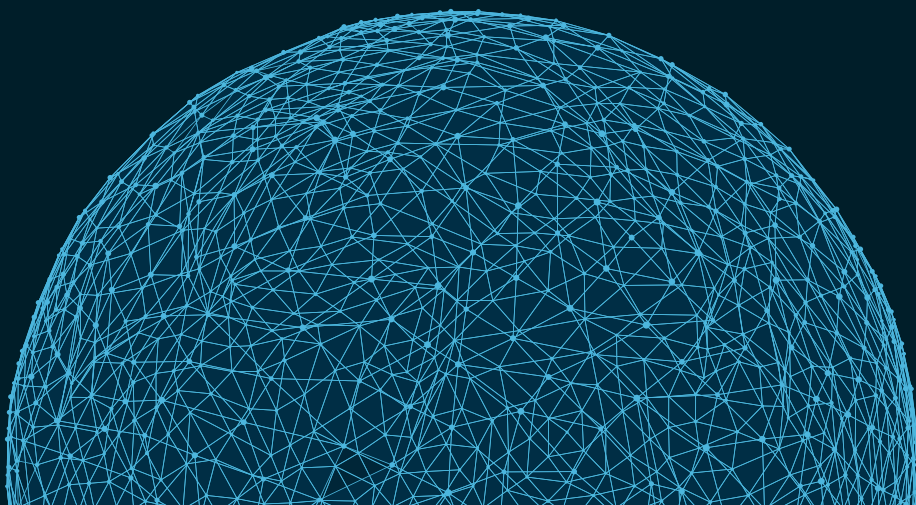
- **Allegion's acquisition of SimonsVoss**
A global producer of safety and security solutions for doors and adjacent areas, Allegion's acquisition of the electronic lock company expands its technical expertise and solidifies its global leadership in electro-mechanical convergence. Allegion's global footprint in the commercial and residential security markets will help drive new growth opportunities for SimonsVoss. Meanwhile, SimonsVoss can contribute industry-leading technology to help Allegion develop solutions for unique customer needs.
- **AMETEK's acquisition of Cognex's Surface Inspection Systems Division (SISD)**
Cognex's SISD is a global leader in nondestructive process inspection with its proprietary high-speed defect recognition technology, software algorithms and deep applications knowledge base, which expands AMETEK's presence in this attractive market segment.
- **Topcon's acquisition of Digi-Star**
Combining Digi-Star, a leading global manufacturer of electronic sensing systems, machine control units, precision load cells and data management software to optimize agricultural and industrial equipment performance, with Topcon Precision Agriculture accessed complementary technologies and distribution channels for Topcon's rapidly growing precision agricultural division.

CRITICAL QUESTIONS

For companies pursuing an industrial technology acquisition, there are several fundamental questions that should be part of the diligence process:

- How differentiated is the technology and what are the barriers to entry? Intellectual property in the form of patents and know-how can provide important protection from competition. In many cases, application engineering and the expertise required to apply technology in a specific market is just as valuable as the technology itself.
- What is the quality of the engineering team? Technology is never static, and engineers are the lifeblood of the new product development process. Does the team have the right core competencies? What are their development track record and pipeline?
- What is the size of the addressable market, and what are the penetration rates? Assessing market opportunities for new technologies is sometimes difficult. Developing a bottom-up analysis of the number of potential customers and likely adoption path is critical.
- How can the technology be leveraged by the buyer? Technology companies often lack the financial and human resources to fully develop their global distribution networks and other core functional areas. Buyers can accelerate the adoption of technology by leveraging existing global channels to market, customer relationships, brands and engineering teams.

These are just some of the critical questions buyers need to ask as they consider potential technology-focused acquisitions. Rapidly evolving markets, relatively high valuations and many other dynamics require careful diligence to ensure buyers capture appropriate risk-adjusted long-term value for their investment.





Institutional
Equities & Research



Global
Investment Banking



Baird Capital

Grow and Thrive

How private equity can drive efficiencies and global expansion in the “New Industrial Revolution”

AUTHOR

ANDREW BRICKMAN
PARTNER
MANAGING DIRECTOR
BAIRD CAPITAL

Private equity firms working to build value in their industrial investments increasingly face numerous opportunities and challenges stemming from a new wave of innovative industrial technologies, process solutions and operations intelligence. For the best chances of success, private equity firms need to be able to leverage a combination of operational experience, a strong global network and deep sector acumen in guiding industrial companies forward.

One example of how all these elements can come together to benefit a portfolio company is Baird Capital's experience with Digi-Star, an agricultural products and process controls company. Through operational initiatives, strategic acquisitions and true collaboration, Digi-Star evolved into a global organization with a modern, comprehensive platform.

VALUE CREATION THROUGH COLLABORATION

Developing a tailored value creation plan is critical to driving growth, even in established companies. At the time of Baird Capital's investment, Digi-Star was a strong platform business that, in order to keep pace with the demands of modern

farming, needed to drive innovation through creative engineering and technology while improving production efficiency.

Baird Capital assessed the company's current state and identified numerous process and manufacturing opportunities. We partnered closely with Digi-Star's management to develop and execute a tailored value creation plan comprising of several key initiatives, including increasing international sales via organic growth and add-on acquisitions, broadening the company's product portfolio in the precision agriculture space, pursuing cost savings via operations initiatives, while driving capital efficiency through better working capital management.



FINDING COST SAVINGS AND EFFICIENCIES IN AN ALREADY WELL-OILED MACHINE

After multiple years of growth in sales, Digi-Star planned to purchase more equipment and expand production into an underused portion of its facility. Instead, Baird Capital teamed with external operations consultants to strategize and implement lean manufacturing initiatives and kaizen events to maximize efficiencies and minimize the need to spend additional capital. Working together, Baird Capital and Digi-Star evaluated production workflow, created standard work and eliminated extraneous tasks.

The team also designed and implemented new work cells and assembly lines that reduced travel time, shrank production batch sizes and decreased work-in-progress inventory. As a result, Digi-Star achieved significant productivity gains, increased sales per square foot and abandoned its previous expansion plans in favor of operating within the existing facility footprint and shift structure. Through these gains, sales almost doubled without an increase of the workforce or the facility.

INTERNATIONAL EXPANSION

To grow international sales, Baird Capital helped Digi-Star identify and acquire RDS Technology, a U.K.-based designer

and manufacturer of instrumentation for agriculture and mobile machinery. The acquisition significantly expanded Digi-Star's international presence and transformed the company into a "one-stop" system of agricultural technology solutions. The acquisition also provided Digi-Star with additional, international original equipment manufacturer (OEM) relationships and a broader global distributor network. These enhancements helped make the company more attractive to a broader array of strategic buyers at exit.

POSITIONED FOR THE FUTURE

Thanks to the partnership with Baird Capital, Digi-Star became a global agriculture technology company with a full platform of solutions that can even be accessed on mobile devices. This shift was critical to the company's continued relevance in the evolving industrial landscape and made it possible for Baird Capital to sell Digi-Star to a large, publicly traded Japanese conglomerate that designs, manufactures and distributes precise positioning products and solutions.

To learn more about Baird Capital's capabilities, investments and team, visit [BairdCapital.com](https://www.bairdcapital.com).

BAIRD'S INDUSTRIAL CONFERENCE

Since 1971, Baird's Industrial Conference, held annually in November in Chicago, has provided the ideal forum for companies' leaders to connect with current and future shareholders as well as key decision makers from across the industry.

45
years

Making Connections, Creating Opportunities

One of the longest-running and largest annual events of its kind in the United States, Baird's Industrial Conference regularly attracts C-level presenters from leading industrial companies, giving them the opportunity to interface with the "who's who" of the Industrial and Energy investment sectors. These executives share their stories with qualified institutional and private equity investors, portfolio managers and buy-side analysts through fireside chat presentations and 1-1 meetings, all carefully coordinated by Baird's renowned conference team.

**FOR INFORMATION ON BAIRD'S INVESTOR CONFERENCES,
VISIT BAIRDCONFERENCE.COM.**

BACKED BY BAIRD'S LEADING PLATFORM

No. **1**

Baird's equity research, sales and corporate access ranked No.1 in multiple categories by Greenwich Associates.¹



Baird has more than 110 sales and trading professionals in 17 offices around the globe, with secondary trading capabilities in 25 international markets.

Baird's integrated Global Investment Banking team advised on 79 M&A deals in 2014 and has completed M&A assignments in 20 countries since 2010.

\$3
billion

Baird's investment and operating professionals in the United States, Europe and Asia have raised more than \$3 billion in private equity and venture capital and invested in 285 portfolio companies.

**TO LEARN MORE ABOUT BAIRD'S ROBUST INDUSTRIAL EQUITIES PLATFORM,
VISIT INDUSTRIAL.RWBAIRD.COM.**

Jon Langenfeld, CFA
Head of Global Equities
Director of Research

Dan Renouard, CFA
Chief Operating Officer
Head of Sales & Trading

Amy Junker
Head of Global Corporate Access

Patrick Spencer
Vice Chairman
Institutional Equities, Europe

Paul Rogalski
Head of Global Industrial
Investment Banking

Joel Cohen
Deputy Head of Global Industrial
Investment Banking

Joe Packee
Deputy Head of Global Industrial
Investment Banking

Andrew Brickman
Partner, Baird Capital
U.S. Private Equity

Scott Hoffman
Operating Partner, Baird Capital
U.S. Private Equity

James Benfield
Managing Director, Baird Capital
U.K. Private Equity

Huaming Gu
Baird Capital
Partner, China Growth Equity



To learn more about Baird's Industrial Platform

Call: 800-RWBAlRD (800-792-2473)

Visit: industrial.rwbaird.com

Follow:



| @rwbaird

| @bairdconference

¹Greenwich Associates U.S. Equity Investors – Small-/Mid-Cap Funds, April 2015. Survey conducted with 92 small-cap and mid-cap fund managers. Rankings for qualitative metrics are based on leading research firms in survey.

©2015 Robert W. Baird & Co. incorporated. Member SIPC. First use: 11/2015. MC-44585.