INSIDER
INDUSTRIAL AUTOMATION & PROCESS CONTROL

VOLUME 21
NUMBER 3
ISSN2334-0789
March 2017

Your key to the latest industrial automation and process control information

Inside this issue:

INSIDER HealthWatch

Something Something?
Page 9

ABB Holds First Ever "Customer World" and closes the factory automation "gap" by buying B&R

ABB opened its first-ever "Customer World" meeting and expo with the explanation from Greg Scheu, president of the Americas Region. "We changed the name," he said, "because we engage with our customers. So it is really the Customers' World."

ABB's Greg Scheu

The event, held in Houston at the George Brown Convention Center, was attended, according to ABB, by over 8000 people. There was no breakdown of company versus customer numbers, though.

ABB's Ulrich Spiesshofer

Ulrich Spiesshofer, ABB's chief executive officer, gave a keynote in which he accentuated the positive.

He noted that digitalization has provided opportunities for all kinds of industries. Telecom, media and finance are well along, but factories, plants and utilities lag. "Industry still has great potential for improvement, which is an opportunity for you and for us," Spiesshofer said. He said that plants need to seize this opportunity to drive maintenance, operations and control to new levels. "If you stand still and say, 'This is not for me,' your competitiveness will be significantly deteriorated."

He called ABB a hidden digital champion, who has connected 70 million smart devices in 70,000 control systems, "but we aren't known for it." Obviously, in order to achieve 70 million smart devices, they aren't just in process automation. They are in electrical distribution and process, and robotics.

Spiesshofer and Jouret listen to Ability introductiion

This hidden champion concept was ABB's way of announcing that they've caught up to the rest of the major automation vendors.

In an innovative walking press conference, ABB took the press corps around the show floor, detailing their new product accomplishments, and incidentally reducing the potential for questions.

ABB Customer World (continued)

They introduced new technologies, mostly in the electrical distribution area, but two standouts in process automation. The first was the meta-system, "Ability."

Guido Jouret, the company's new Chief Digital Officer, who came from outside the automation industry (Cisco and Nokia among others), described Ability in his own keynote. It had been developed jointly by ABB and Microsoft, he said. Microsoft's contribution was common technologies for enabling device, edge and cloud application delivery, especially through Microsoft's cloud delivery solution, Azure. The Ability platform will provide solutions in utilities, industry, transportation and infrastructure. It will deliver secure, digital solutions on premises with fog computing from devices to the edge, in the cloud that goes up from the edge, and now in a projected "intercloud" strategy, which Jouret didn't specify. Moving data and information derived from data among various cloud platforms is where meaningful integration can be performed most easily.

"ABB Ability 800xA will do everything it already does, but now we're adding self-learning so it can perform even better," added Jouret. "We're looking at integrating supply chains, and integrating with upstream and downstream users."

Even so, Jouret went on to describe the second technology that has brought ABB current with the other vendors. "It's rather 'charm'ing," said one member of the press after seeing the new "Select I/O" programmable input/output system, with a wry nod to Emerson Process Management's Charm programmable I/O system, introduced several years ago.

Basically, what Jouret, brought in only a few months ago, has done is to gather existing ABB capabilities, put them together and rename them Ability. He noted that there were already more than 180 applications, some of which were existing and extended onto the Ability platform. He gave examples of the solutions that have been successful.

In the utilities area, Ability users have reduced installations times by 40%, maintenance costs by 50% and outage times by 50% in asset performance management, distributed energy resource management, maintenance workflow management, energy market trading systems, automated digital substations, standard IP communications and microgrids. Industrial applications of Ability improved productivity by 200%, reduced energy by 30% and increased product life by 30%. These applications include connected robots, manufacturing executions systems, energy assessments, cybersecurity assessments, digital simulation for robot deployment, power quality monitoring and demand-response, distributed control systems, remote monitoring and optimization. There was more, in the transportation and infrastructure industries.

Select I/O is a Ethernet based single channel I/O solution for ABB Ability™ System 800xA that offers full redundancy down to the Signal Conditioning Module. Each signal coming from the field is conditioned individually with a Signal Conditioning Module (SCM) for both process and safety applications.

ABB's new Select I/O, with prefabricated marshalling cabinet

The Select I/O together with the innovative xStream Engineering tools helps decouple project tasks, minimize the impact of late changes and supports standardization of hardware and cabinets helping projects come on time and under budget. A robust field friendly design provides features such as hardware selectable I/O types; field disconnect mode (connected to system, but isolated from the field); keyed terminal blocks; electronic current limitation and galvanically isolated (per channel); line monitoring for all I/O types; extended temperature ranges (-40 to +70 deg C); Up to 192 SCM's per Ethernet I/O cluster; Zone 2 and Class 1 Division 2 hazardous area classification standard; SIL3 certified safety modules (DI, DO, AI, AO); Single channel and multi-channel (S800) I/O in the same system / Ethernet I/O network; HART variables to the application; Sequence Of Event recording for Digital Input (1 ms); and support for digital marshalling any channel to any controller.

ABB's Customer World (continued)

Big Noise from Factory Automation

Just as the INSIDER was going to press, word was received that ABB had acquired B&R Automation.

B&R, founded in 1979 by Erwin Bernecker and Josef Rainer is headquartered in Eggelsberg, Austria, operates across 70 countries, generating sales of more than $600 million (2015/16) in the $20 billion machine and factory automation market segmenti n which ABB has never been a successful player. ABB believes that this acquisition, combined with the robotics of the group, should make them a significant player in factory automation, despite the dominance of Siemens, Schneider, and Rockwell Automation.

ABB says they are taking a major step in expanding its digital offering by combining its ABB Ability meta-MES, with B&R's sapplication and software platforms, installed base, customer access and tailored automation solutions.

"This transaction marks a true milestone for ABB, as B&R will close the historic gap within ABB's automation offering. This is a perfect fit and will make us the only industrial automation provider offering customers the entire spectrum of technology and software solutions around measurement, control, actuation, robotics, digitalization and electrification," said ABB CEO Ulrich Spiesshofer. "This acquisition perfectly delivers on our Next Level strategy. With our unique digital offering and our installed base of more than 70 million connected devices, 70,000 control systems and now more than 3 million automated machines and 27,000 factory installations around the world, we enable our combined global customer base to seize the huge opportunities of the Fourth Industrial Revolution."

Erwin Bernecker

"This is a strong signal for our employees as our operations in Eggelsberg will become ABB's global center for machine and factory automation," said Erwin Bernecker, co-founder of B&R. "The most important thing to me is that the companies and their people fit so well together and that our founding location will play such a key role."

Complementary strengths

With the acquisition, ABB will expand its industrial automation offering by integrating B&R's products in PLC, Industrial PCs and servo motion as well as its software and solution suite. ABB will offer its customers a uniquely comprehensive, open-architecture automation portfolio.

B&R has grown successfully with a revenue CAGR of 11 % over the last two decades. Revenues more than quintupled since 2000 to more than $600 million (2015/16). The company has a rapidly growing global customer base of more than 4,000 machine manufacturers, a proven track record in automation software and solutions and unrivaled application expertise for customers in the machine and factory automation market segment. .

Substantial investments in innovation

B&R invests more than 10 percent of its sales in R&D and employs more than 1,000 people in R&D and application engineering. ABB spends $1.5 billion annually on R&D and employs some 30,000 technologists and engineering specialists. Going forward, ABB and B&R will continue to invest considerably in R&D.

Josef Rainer

Proven integration approach

On closing of the transaction, B&R will become part of ABB's Industrial Automation division as a new global business unit – Machine & Factory Automation – headed by the current Managing Director, Hans Wimmer. The co-founders of B&R, Erwin Bernecker and Josef Rainer, will act as advisors during the integration phase to ensure continuity. ABB says they want to drive B&T a mid-term sales of in excess of $1 billion.

B&R's headquarters in Eggelsberg will become ABB's global center for machine and factory automation.

The *INSIDER's* March 2017 Roundup

Not Much New for Automation at INTERPHEX

The International Pharmaceutical Expo (INTERPHEX) held at the Javits Center in New York City on 21-23 March 2017 filled the large upstairs exhibition hall with over 625 exhibitors and had over 100 technical sessions scheduled. The small amount of instrumentation and control equipment that was exhibited was strongly focused on pharmaceutical industry requirements and was embedded within the "Process Components, Supplies & Instrumentation" section of the show directory. Examples of items on display include Broadley-James pH/ORP sensors designed for biotechnology processes, Sonotec non-invasive ultrasonic flowmeters, and StoneL (Metso) valve communication network equipment that can be used to address validation issues.

Update from Brasil

There is some positive news to report about Brasil. For starters, Moody's upgraded Brazil's rating from negative to stable and the number of formal jobs increased in February after decreasing for 22 consecutive months. Now that Carnaval is over, the economy shows anecdotal evidence of improving and growth forecasts are slightly positive (in contrast to last year's contraction of over three percent). On a side note, Itaipu Dam is now the global leader in annual power generation. But there are significant headwinds…

More on Petrobras

The Petrobras scandal is rambling into its fourth year and 38th phase with no end in sight. Almost 200 people have been investigated and/or imprisoned. Approximately USD 3 billion is reported to have been recovered so far. The Odebrecht depositions could lead to the opening of approximately 200 new investigations (mostly against politicians), approximately 80 of which may be directed to the Brazilian Supreme Court. A number of President Temer's cabinet ministers are expected to be implicated.

Collateral damage includes a model and Playboy cover girl who allegedly laundered money and hid assets for her ex-lover who was a key figure early in the Petrobras scandal investigation. The INSIDER opines that she likely had no idea of the origin of the money used to purchase her apartment or used to pay her expenses. She has reportedly been distraught since discovering that she is a subject of the investigation.

The Importance of Specialist Automation Suppliers

By Nick Denbow

This article was first published in the Technews South African Instrumentation & Control Journal, The March 2017 issue, covers the approach of some of the smaller, specialist suppliers to their own selected sectors of the process industries.

While the major DCS suppliers try to work out how to provide revenue earning services from the growth of the IIOT, there are many specialist engineering product and systems suppliers who are investing in making their products easier for engineers to use in networks, and operate within the IIOT.

Most of these specialists are primarily focused on the production of their valves, sensors, controllers or drives: this is their business - and they need their products to work with any interface the customer requires. Their expertise in interfacing their own products is the best available, they have an in-house systems knowledge base and capability. Most now offer this capability to their would-be product users as a service – offering a custom designed system incorporating the products. So look to these suppliers to offer the best engineering at an economic price, within their specialist field.

Typically, these single-minded companies were set up by a design engineer with a good original product idea, and this has been developed and refined over the years. Often the company is family owned – and engineering / R&D investment takes precedence over profit distribution. Some such companies still exist in the USA, and a few in the UK, like JCB and Rolls Royce. Several specialist engineering product examples are found in suppliers originating from Germany, Scandinavia and middle Europe, where the culture seems to have encouraged their survival.

Beckhoff Automation

Arnold Beckhoff started his company in 1953: Beckhoff Automation now has a turnover of Euro 620 million, and employs 3350 people. The company implements open automation systems based on PC control technology, scalable from high performance Industrial PCs to mini PLCs, I/O and fieldbus components, plus drive technology and automation software. Supplying systems to many industries, Beckhoff works with and supplies components for over 15 major fieldbus systems. Motion control

The *INSIDER's* March 2017 Roundup (continued)

solutions solve single and multiple axis positioning tasks, and their servomotors offer combined power and feedback over a standard motor cable.

The Beckhoff TwinCAT 3 engineering and control automation software integrates real-time control with PLC, NC and CNC functions in a single package, and then all Beckhoff controllers are programmed using TwinCAT in accordance with IEC 61131-3. While the built-in TwinCAT condition monitoring libraries allow the on-site controllers to monitor the status of the sensors, to reduce downtime and maintenance costs, it also allows wider comparisons with connections to such cloud services as Microsoft Azure or Amazon Web Services. Other data connections are available, for example a smartphone app enables immediate local and mobile display of a machine's alarm and status messages.

Bürkert Fluid Control Systems

Bürkert was founded in 1946 by Christian Bürkert: it now has sales of Euro 412 million and employs over 2500 people. The product base is gas and liquid control valves, systems for measuring and controlling gases and liquids, plus sensors for monitoring such fluids, extending to complete automation solutions and fluid systems – this capability is known as their 'Systemhaus'. While their products are now applied across many industries, their particular specialisations have been in sanitary, sterile and hygienic applications (food, beverage, biotech and pharmaceuticals), micro applications (medical, inkjet and beverage mixing/ vending), and water treatment industries.

From the UK operation, Bürkert provide locally engineered solutions and systems for their pharma, food and brewery customers in particular. Locally made craft beers are a major growth area in the UK, and most start small, with no real automation. One example was Stroud Brewery, who needed to expand production by a factor of 5x, and preferably not increase their staff numbers: Bürkert designed a PLC system and intelligent control panel, which automated the temperature control of the cold and hot liquor tanks, and in the mash pan. In addition a system for controlling the run-off rate from the mash tun simply uses three separate Bürkert level sensors.

Bürkert also have developed their own 'Device Cloud', they call this 'mySITE'. This collects data from Bürkert sensors around the world, using an on-site interface known as mxConnect - which can also accept data inputs from other sensors.

National Instruments

National Instruments was only started in 1976, in the USA, by Dr James Truchard and a colleague, who are still involved in the business. Now sales are $1320 million, and they have 7400 employees worldwide. Their declared Mission is to "equip scientists and engineers with systems that accelerate productivity, innovation, and discovery" – and their focus has always been to supply research establishments and engineers with open, software-centric platforms with modular, expandable hardware. This gives its own logistics problems, with 35,000 customers served annually.

It is difficult for me, as an outside observer, to relate the NI systems to an oil refinery or chemical plant application: but it comes into its own when the data handling grows in complexity – for example in pharmaceutical and biotech applications, and the sort of plants where engineers have a major input in monitoring the application. Mention cyclotron or Tokomak, CERN or the Large Hadron Collider, and NI and its LabView are embedded in their engineering control systems. All 108 collimators on the LHC are position controlled using LabView.

National Grid UK, which controls the distribution and transmission of electric power round the country, has adopted a control system based on the NI CompactRIO for the whole network. With many new power generating sources, HVDC connections, variable inputs from solar and wind farms, and the phasing out of major fossil fuelled plants, National Grid found that traditional measurement systems did not offer adequate coverage or response speed to handle these new challenges and risks. They adopted a platform, based on the CompactRIO, to provide more measurements - and also adapt with the evolving grid for generations to come. This interconnected network includes 136 systems, with 110 permanently installed in substations throughout England and Wales and 26 portable units that provide on-the-go spot coverage as needed. The associated software systems provide their engineers with customized measurement solutions that can be upgraded in the future as new grid modernization challenges arise.

In terms of IoT developments, NI has just opened an Industrial IoT lab at the NI Austin HQ in the USA, to focus on intelligent systems that connect operational technology, information technology and the companies working on these systems. Many other companies are co -operating in this venture, like Cisco and SparkCogni-

The *INSIDER's* March 2017 Roundup (continued)

tion, and the lab intends to foster such collaboration to improve overall interoperability. In addition NI has partnered with IBM and SparkCognition to collaborate on a condition monitoring and predictive maintenance testbed: this will use the SparkCognition cognitive analytics to proactively avoid unplanned equipment fatigue and failure of critical assets.

YOKOGAWA Names Mori

Yokogawa Corporation of America has finally named a successor to Daniel Duncan, who replaced the highly-successful Chet Mroz on April 1, 2015. Duncan's short tenure was marked by problems and an inability to work with the Japanese business systems. Yokogawa announced that Shuji Mori, who is a Vice President and Chief Executive for North and South America, will become President of Yokogawa Corporation of America. Mori is a company veteran who has been with Yokogawa for nearly three decades. In the role of CEO, Mori is responsible for all day-to-day business operations in North America and South America.

Dan Duncan—OUT

Shuji Mori — IN

Mori began his career as an engineer, who implemented systems projects for Yokogawa customers Worldwide. He has held a variety of roles throughout the company, most notably in global major account sales, and has acquired extensive experience in the global industrial automation market, according to the company's press release.

"At the end of the day, all successful business is based on personal trust. We always aim to understand our customers first – their business goals, the challenges they face and how their companies operate," says Mori. "I will make every effort to ensure Yokogawa's day-to-day operations in North America remain focused on generating new value with our customers and driving the growth of their businesses."

It will be interesting to see how appointing a Japanese lifetime employee will help to "internationalize" Yokogawa Corporation of America. Yokogawa continues to say that they want to make themselves more global, less Japan-centric. This may not be the best way to do it. Some Yokogawa contacts even suggested bringing back Chet Mroz.

ARC Conducts Procedural Automation Survey

On behalf of ARC and ISA106, the INSIDER is posting this: ARC industry analysts are conducting a web survey regarding procedure automation. The survey is only 20 questions and is targeted for owner/operators. ARC will share the results of the survey with our committee. I think this will give us helpful insight on the interest level and relative status of the practice in industry. Please consider participating in the survey, it is available at: https://www.surveymonkey.com/r/HSP8BPS .

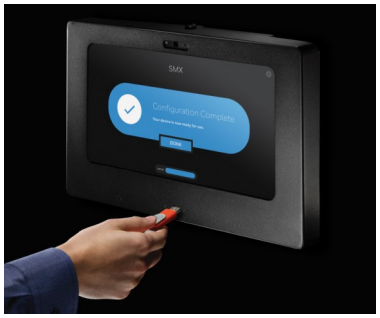
If you would pass the survey along to your clients and customers, as well as doing it yourselves, ARC and ISA106 (full disclosure: Walt Boyes is a non-voting member of ISA106) would be grateful.

Statseeker's Big New Idea

Statseeker, a former client of Spitzer and Boyes LLC, has released a new white paper called "Digital Transformation" and says, "Smarter, connected networks add complexity, but the plant floor can't be an island anymore." The white paper, available on www.statseeker.com, discusses the uses of network visualization tools to improve the digital transformation of OT networks, as well as IT networks. Traditionally, this sort of network tool has been restricted to IT networks, but as the OT network becomes more complex, the need for top notch visualization tools has become critical. Read the white paper for more of the argument.

Honeywell Debuts New Cyber Tools

Honeywell Process Solutions (HPS) announced on April 4th, a new solution for industrial sites as they balance productivity and cyber security demands. Honeywell's new Secure Media Exchange (SMX) protects facilities against current and emerging USB-borne threats, without the need for complex procedures or restrictions that impact operations or industrial personnel.



New SMX USB security tool

Malware spread through USB devices – used by employees and contractors to patch, update and exchange data with onsite control and computer systems – is a key risk for industrial control systems. It was the second leading threat to these systems in 2016, according to BSI publications, and uncontrolled USBs have taken power plants offline, downed turbine control workstations, and caused raw sewage floods, among other industrial accidents.

"Industrial operators often have hundreds or thousands

The *INSIDER's* March 2017 Roundup (continued)

of employees and dozens of contractors on site every day," said Eric Knapp, Cyber Security chief engineer, HPS. "Many, if not most, of those rely on USB-removable media to get their jobs done. Plants need solutions that let people work efficiently, but also don't compromise cyber security and, with it, industrial safety."

Currently, many plants either ban USBs, which is difficult to enforce and significantly reduces productivity, or rely on traditional IT malware scanning solutions, which are difficult to maintain in an industrial control facility and provide limited protection. These solutions fail to protect process control networks against the latest threats, and offer no means to address targeted or zero-day attacks.

Honeywell's SMX was developed by the company's cyber security experts based on field experience across global industrial sites and feedback from Honeywell User Group customers. Honeywell has one of the largest industrial cyber security research capabilities in the process industry, including an advanced cyber security lab near Atlanta. Honeywell also partners with cyber security leaders, including Microsoft, Intel Security and Palo Alto Networks, among others, to develop new, highly-effective industrial threat detection techniques.

Honeywell's SMX provides hassle-free, multi-layered protection for managing USB security, letting users simply plug in and check devices for approved use in the facility.

Honeywell's Eric Knapp

Contractors "check-in" their USB drive by plugging it into an SMX Intelligence Gateway. The ruggedized industrial device analyzes files using a variety of techniques included with Honeywell's Advanced Threat Intelligence Exchange (ATIX), a secure, hybrid-cloud threat analysis service. SMX Client Software installed on plant Windows devices provides another layer of protection, controlling which USB devices are allowed to connect, preventing unverified USB removable media drives from being mounted, and stopping unverified files from being accessed. SMX also logs USB device connectivity and file access, providing a valuable audit capability.

"For most plants, the proliferation of removable media and USB devices is unavoidable, but the security risks they bring don't have to be," said Knapp. "We know our customers have limited resources to maintain another system, so Honeywell manages SMX for them. SMX never connects to our customers' process control networks. From a system administration perspective, it's like it's not even there."

Managed and maintained directly by Honeywell, SMX provides the easy and secure solution to USB security in industrial plants. It helps prevent the spread of malware through removable media; stops unverified files being read by Windows hosts; and, through the private ATIX connection, provides continually updated threat information and advanced analytics to help detect advanced, targeted, and zero-day malware.

Clearly this is a great thing for Honeywell customers, but it is not clear how plants with multiple vendor systems will deal with it. It certainly is not clear how other vendors will like the idea of potentially having their proprietary files uploaded to Honeywell's ATIX cloud app.

OPTO 22 Does Strategic Alliance With IBM

With playing with the big boys a coming necessity, it is likely we'll see more of this.

Opto 22 announced their acceptance into the IBM Watson IoT Partner Ecosystem. This partnership provides developers with a full stack toolset for building applications that connect real-world signals and data from industrial "things" to the digital world of information technology, mobile, and cloud computing.

The partnership between IBM and Opto 22 will enable developers to rapidly design, prototype, and deploy applications to connect existing industrial assets to the IBM Watson IoT platform and share their data, capabilities, and resources with other connected systems and assets, to build the Industrial Internet of Things (IIoT).

Building IIoT applications has historically been complex, requiring multiple layers of expensive middleware and significant developer manpower. IIoT applications built from the ground up can take months or even years, and require expertise in both the operations technology (OT) domain, where industrial assets live, and the information technology (IT) domain, where digital and cloud computing assets exist. These long development cycles increase cost, slow time to market,

The *INSIDER's* March 2017 Roundup (continued)

and increase risk of IIoT project failure for customers. Together these problems delay and reduce the return on investment for implementing IIoT applications.

Through this new partnership between IBM and Opto 22, developers and systems integrators have a concise toolset for connecting the OT and IT domains. The partnership combines over 40 years of OT domain expertise and innovation from Opto 22 with over 100 years of IT domain expertise and innovation from IBM. Combining open technologies like RESTful APIs and Node-RED with powerful and proven computing platforms like the IBM Watson IoT platform decreases development time, eliminates the need for expensive middleware, reduces risk for customers, and gets solutions to market faster.

Developers can connect, set up, and manage edge processing devices like programmable automation controllers from Opto 22 and apply real-time analytics, cognitive services, and blockchain technology to the data generated by these devices. Cognitive APIs deliver natural-language processing, machine-learning capabilities, text analytics, and image analytics to help developers realize the potential of the cognitive era with the IBM Watson IoT Platform.

Connecting existing industrial assets to IT systems requires translating the electrical signals (voltage and current) in the physical world to the bits and bytes of the digital world. Opto 22, respected worldwide for its 42-year history of product quality and innovation, manufactures the I/O and controllers that translate signals at the network edge from industrial assets into the language cloud computing systems like the Watson IoT Platform understand.

With a rich history in industrial automation, process control, building automation, industrial refrigeration, remote monitoring, and data acquisition applications, Opto 22 products provide robust industrial automation protocol support, including Modbus/TCP, EtherNet/IP and OPC UA. These industrial products also communicate and support well-known Internet technologies to support IIoT applications.

OPTO 22's Benson Hougland

"The industrial automation and control industry is in transition right now," says Benson Hougland, Vice President of Marketing and Product Strategy. "A product development strategy based on proprietary and closed technologies is outdated. The future of industrial automation and process control lies in the rising API and data economies made possible through open standards-based technologies. Our objective in partnering with IBM is to enable IIoT developers to build their applications faster using well-known and proven Internet tools and technology like Node-RED, RESTful APIs, and the IBM Watson IoT Platform."

Designing Sensors for the IIoT

Spitzer and Boyes LLC is preparing a subscription report, "Designing Sensors for the IIoT" which will be available mid-May 2017.

This report will be a detailed prescription for what the future of sensor, transducer, analyzer, and transmitter design will bring. Edited and produced by Walt Boyes, this report will give you a front row seat to the next several generations of field device design.

Topics covered in the report include:

- Simplified sensor design
- Taking cost out of sensors and transmitters
- Dealing with HMIs and programming
- Communications to and from the field device; standards and protocols
- Sensor network architectures for the IIoT
- Control in the sensor
- New types of sensors and transducers
- "Maker" culture and its effect on sensor design

Walt Boyes and David W. Spitzer are both Life Fellows of ISA, and Walt is also a fellow of InstMC in the UK, and a member of the Association of Professional Futurists.

David W. Spitzer

Walt Boyes

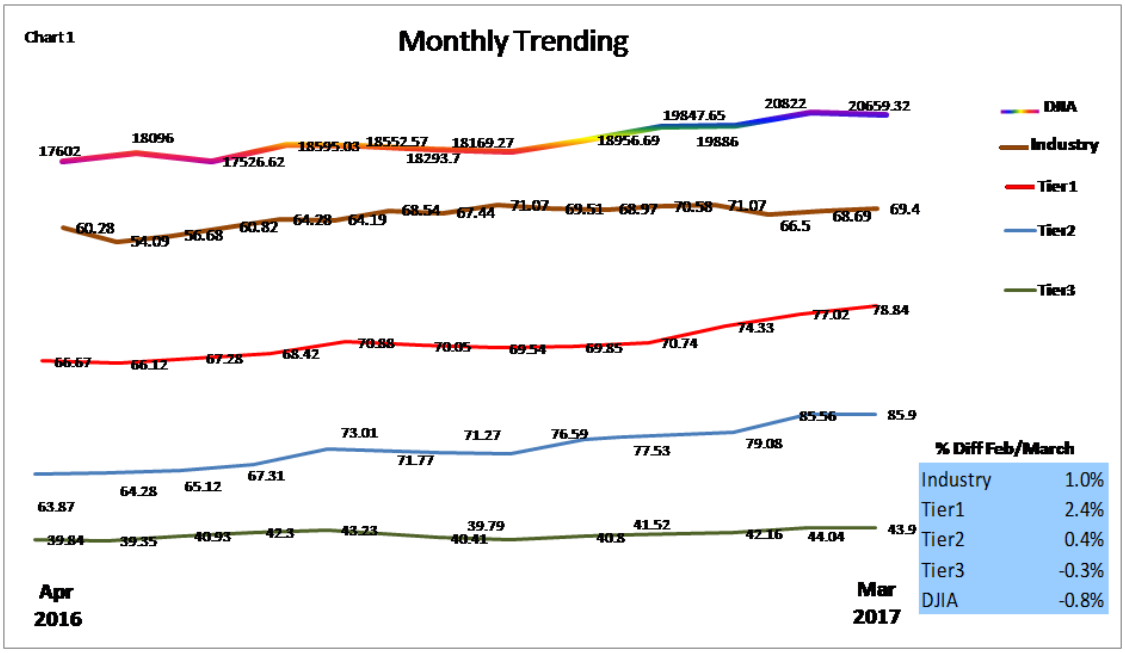
"We know where sensor design is going, and we can help you get there faster, with this report," Boyes says.

The report, a PDF with digital rights management, will sell for $1500.00, but pre-orders will pay only $1200. Multiple orders for the same company will receive further discounts based on quantity. Contact dspitzer@spitzerandboyes.com to pre-order your copy of the report.

Over the brink and back again?

INSIDER
INDUSTRIAL AUTOMATION & PROCESS CONTROL

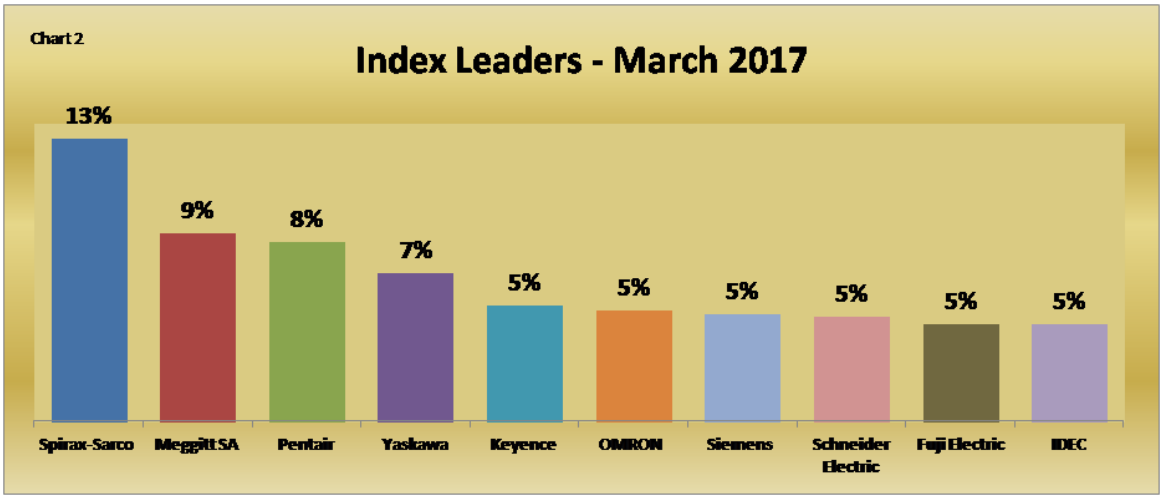
Health



Alice in Wonderland look like the utmost in sanity and normality. Trump continues to make moves that will shake the normalcy of business as he tries desperately to bring back the jobs he simply can't find, because they no longer exist.

The winners this month were very good winners, led by Spirax Sarco with a 13% gain, Meggitt with a 9% rise, Pentair with 8%, Yaskawa at 7%, Keyence, Omron, Siemens, Schneider, Fuji Electric and IDEC all at 5%. It is good to note that Schneider has apparently found its

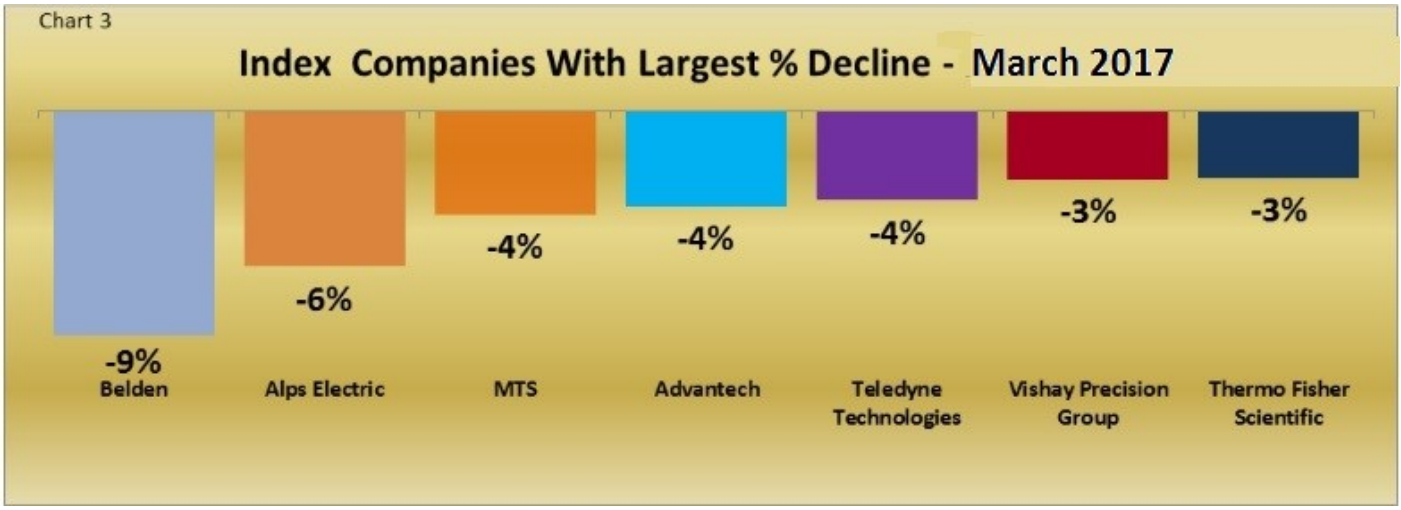
After both the Health Watch and ARC reported a dismal fourth quarter for 2016, things are (maybe) looking up. Our industry out-performed the Dow by 1.8%. The important thing to note is that the Dow dipped almost 1% while we moved upward by almost the same percentage. Tier 1 showed the largest gain, increasing 2%, but in general both the Dow and the Industry were stable with no huge dips or jumps to discuss. It sometimes looks to the INSIDER as if we (and the rest of the world) are playing a waiting game. I'm not sure what we're waiting for… the end of the world maybe… or possibly just the next move from the Trump White House in this chess game that makes



Over the Brink and Back Again? (continued)

INSIDER
INDUSTRIAL AUTOMATION & PROCESS CONTROL

Health Watch



groove, and gone from –4% last month to +5% this month.

Belden leads those less fortunate, this month, down again, as are Alps, MTS, Advantech, Teledyne, Vishay, and Thermo Fisher Scientific.

On the good news front, we are seeing increasing growth in both the manufacturing sector and the services sector in China, for the foreseeable future. This is great news for those automation vendors who are deeply invested in the Chinese market, but the increases are also raising the indigenous producers, like Hollysys, as well as the major global players.

We are also beginning to see Chinese manufacturers of field devices move into the global market, specifically to take advantage of the fact that the Industrial Internet of Things requires substantially more sensors, at substantially lower cost. Chinese vendors are all about that. Quality is beginning to improve, also. Indian sensor companies are beginning to feel their way into export now that the economic position of India is favorable too.

THE WAY I SEE IT
Editorial

"Aw, no, it wasn't the airplanes, it was beauty killed the beast!"

That's the ending of the first King Kong movie(the good one from the 1930s), where the great ape is shot down from the Empire State Building's spire by a bunch of World War I biplanes. The reason I am starting there is because there is a lot of confusion about the future of jobs, who killed them, and what will happen next.

The story started out that it was automation that was killing jobs, and that's been true for more than thirty years now. Almost all the productivity gains in the last three decades have come from increasing automation in manufacturing. Somehow, it was said, we needed to bring back those good old fashioned un-automated jobs for the people in the USA who didn't finish high school, or didn't go to college. But what actually happened was that the only way to keep factories open in North America was to automate the pants off them, to be able to compete with the low cost of employment countries, like China, India, Mexico, Vietnam, Thailand, and on and on.

Then the lost cost countries started to automate, too, because they couldn't compete with the quality, delivery, and price of newly automated plants in the US and Western Europe. China is now the largest buyer of robots in the world.

That was the next thing...that robots were stealing all the jobs. There is limited truth in that, too. Robots, expecially collaborative robots like Baxter and ABB's YuMi, can take over highly repetitive tasks from humans and do them faster, longer, and better than people can. But there were plenty of jobs that required human decision making skills that robots could not replace.

Watson, IBM's great all purpose supercomputer can compose music, write stories, and play chess, not to mention beat Ken Jennings on Jeopardy. And if you go to H&R Block, Watson will do your taxes for you, too.

Those are the jobs that are being lost, now. The jobs that require decision making skills that up to this point were only available from humans. AIs are now beginning to replace humans in decision making roles, and this is replacing a whole new stratum of workers—white collar knowledge workers and managers. When a supply chain is completely automated, day to day purchasing managers are simply not needed. Nor are schedulers, middle managers, and most supervisors.

Paralegals and many lawyers are being replaced by AI software, and so are low level medical personnel.

If you are just joining the workforce, be prepared to lose your job to a computer program sometime in the next ten years. Even editors and writers are being replaced by computer generated content. Watson, IBM's great all purpose supercomputer can compose music, write stories, and play chess, not to mention beat Ken Jennings on Jeopardy. And if you go to H&R Block, Watson will do your taxes for you, too.

The point is that there is more than one reason that jobs are going away. We'll find jobs for some of the people who will be surplus, but not for all of them. If you are in your 40s, with no education beyond high school, you might want to look deeply inside and figure that you are probably permanently unemployable. So go back to school no matter how hard it is.

No, it isn't the robots. It isn't automation. It's the software that killed the jobs.

Comments? Talk to me!
waltboyes@spitzerandboyes.com

Read my Original Soundoff!! Blog:
http://waltboyes.livejournal.com

The Industrial Automation and Process Control INSIDER™ is published by Spitzer and Boyes LLC., Copyright 2014-2017, all rights reserved.

The INSIDER is edited by Walt Boyes. Joy Ward is a columnist. Additional reporting is done by David W, Spitzer PE., Rajabahadur V. Arcot, Nick Denbow, and Steven Meyer.

The INSIDER is a subscription based publication and does not take advertising. This means that the INSIDER can be completely independent and unbiased in its reporting and in its analysis.

To subscribe to the INSIDER, please visit http://www.iainsider.co.uk and click the "Become an Insider" button.

Send comments to insider@spitzerandboyes.com. We want to hear from you!

Rajabahadur V. Arcot: Is manufacturing's restoration to its erstwhile position necessary for America's future?

The people of America elected Donald Trump as their President largely based on his promises that he will address all their issues, especially those relating to manufacturing industry – its diminishing role in America and the shrinking job opportunities it offers.

Years of prosperity enjoyed by America, the world's largest economy, during which time the manufacturing industry offered well-paying job opportunities to its people, have conditioned them to expect that good times will continue forever.

Days have changed, prosperity began to spread to many other countries, and this trend continues unabated. New consumption centers sprang up to meet their needs and the manufacturing industry spread with many American industrial companies benefitting directly from the spread of globalization.

While delivering his inaugural address, Donald Trump spoke about the proposed steps that he and his administration would be taking to redeem his promises to the people who voted him to the office.

In his speech, echoing his understanding of the sentiments of the American people, the President articulated his belief that America has made other countries rich, while the wealth, strength and confidence of the country has dissipated over the horizon and jobs have left the American shores leaving the factories closed across the land.

Contrasting Americans' dream with the existing-situation on the ground, he said while Americans want good manufacturing jobs for themselves, in reality they find rusted factories scattered like tombstones across the country's landscape.

Donald Trump's roadmap for bringing prosperity to America

Actions of his administration will determine the future course of America and the world for many years to come is what he assured the audience; he will get the job done, despite all challenges and hardships that his administration may face, is what he promised them.

While President Trump's understanding that people want well-paying manufacturing jobs is right, his assumptions that manufacturing has been stolen from America...are misplaced.

His roadmap for bringing prosperity to the people of America is to ensure that "every decision on trade, on taxes, on immigration, on foreign affairs will be made to benefit American workers and American families. We must protect our borders from the ravages of other countries making our products, stealing our companies and destroying our jobs."

His promises include bringing back jobs and wealth to the people of America and rebuilding the country with American hands and American labor that will be governed by out two rules: buy America and hire American.

While President Trump's understanding that people want well-paying manufacturing jobs is right, his assumptions that manufacturing has been stolen from America by others and measures such as withdrawal from the Trans-Pacific Partnership (TPP), renegotiation of NAFTA or withdrawal, taxing companies to ensure buy American and hire American will restore manufacturing as the dominant provider of good jobs and restore it to its preeminent place in America are misplaced.

Also, his basic conjectures that the wealth of the country's middle class has been ripped from their homes and then redistributed all across the world, outsiders are responsible for the loss of American manufacturing jobs, and trade agreements have not best served the

Rajabahadur V. Arcot: Is manufacturing's restoration to its erstwhile position necessary for America's future? (continued...)

country's interests are misdirected.

Manufacturing Industry in America and impact of trade pacts

Let us examine the assumption that the manufacturing industry has been stolen by others by looking at the performance of the manufacturing industry in America.

While over the years there has been a decline in the share of manufacturing jobs, the industrial output has risen due to improved productivity. A recent article in the *Financial Times* highlights that, while between 1950 and 2016, the manufacturing output rose 640 per cent, the employment fell 7 per cent.

...all the increase in employment between 1950 and the end of 2016 occurred outside manufacturing; this provides a pointer to the future - both to the policy makers and job seekers.

In addition, the article also points out that in 1950, employment in manufacturing was 13 million compared to 30 million in the rest of the economy. By the end of 2016, it was 12 million and 133 million respectively. The above data indicates that manufacturing has indeed done well in America in terms of growth and the marginal job losses are more than compensated by productivity gains.

Therefore, it may not be appropriate to conclude that manufacturing has left the shores of America along with the jobs. The article goes on to highlight that all the increase in employment between 1950 and the end of 2016 occurred outside manufacturing; this provides a pointer to the future - both to the policy makers and job seekers.

Regarding the impact of trade pacts on jobs and relocation of factories, according to *Wharton School's online business analysis journal*, after NAFTA came into effect, automotive companies, such as Toyota, Nissan, Mercedes, and BMW along with their supplier partners established plants in Alabama, South Carolina, Tennessee, and other states. A *New York Times* report points out that these and other such companies employ thousands of factory workers and highlights that G.M. gets more than a quarter of its auto-related sales outside North America, while Ford gets a third.

Therefore, the President's proposed remedial measures based on above assumptions and surmises can only complicate matters and take the world back to the pre-WTO days and lead to tariff wars and abrogation of trade treaties with no winners emerging.

New avatar of manufacturing and its implications

Let us turn our focus on how manufacturing benefits America even though the industry is no longer the dominant job creator in America. The evolution of the manufacturing industry from vertically integrated structure into an ecosystem comprising of value chain partners located across the world has resulted in the globalization of manufacturing and expansion of the global trade.

The value chain partners, enjoying core competencies and competitive advantages in things that they offered, produced cost-effectively things which they are good at making; the extensive use of information technology led to the emergence of connected enterprises.

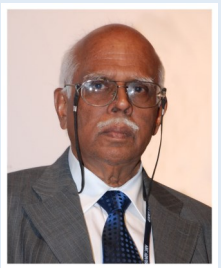
The evolution of the manufacturing ecosystem gave a big boost to global trade that spurred countries and regions with complimentary competitive advantages to enter into trade agreements, such as North American Free Trade Agreement (NAFTA) and Trans-Pacific Partnership (TPA).

While some manufacturing, where the US did not enjoy competitiveness, left the shores, on the overall the manufacturing productivity has improved and cost of merchandise goods declined. This brought big benefits both to the American manufacturing industry and consumers.

True, as a consequence of globalization of manufacturing, some economies such as China, Korea, and others expanded and their workers also benefitted.

The spread of economic growth beyond the shores of developed countries including America created new markets not only for the

Rajabahadur Arcot is an Independent Industry Analyst and Business Consultant, and Director Asia Operations for Spitzer and Boyes LLC**with 40 years of senior management experience. He was responsible for ARC Advisory Group in India. Contact him at rajabahadurav@gmail.com**



Rajabahadur V. Arcot: Is manufacturing's restoration to its erstwhile position necessary for America's future? (continued)

American manufacturing companies but also for others in developed countries, such as Germany and Japan. This contributed to manufacturing companies' growth & profitability and helped them achieve economies of scale.

In this context, it must be stated that increased investments by the manufacturing industry as a whole in machines and automation while helping them to achieve better efficiencies also resulted in slashing of jobs; according to some reports eighty percent of lost jobs were not replaced by workers in China, but by machines and automation.

Better to get ready for the future

Going by the recent technological developments, such as robotics, artificial intelligence, and such others, it will be safe to assume that their entry into main stream manufacturing will result in replacing more workers, but continue to create new job opportunities in related sectors. This news may not be cheerful to all those who still believe that manufacturing in America can be resurrected to occupy the place it once occupied, unless they take the advice of Bill Gates seriously.

In a recent interview, anticipating that robots will replace large numbers of workers over the next 20 years, he proposed that robots should be taxed so as to slow down the pace of automation and for raising funds to retrain workers to be skill ready for new jobs.

Bill Gates was right in saying that it is better to get career seekers ready for the jobs of the future rather than give them false hopes and attempt to resurrect the past. The strategy aimed at generating new sources of employment and empowering the workforce to gain skills of the future will deliver superior results and put to rest the anxiety of many other stakeholders to a better tomorrow.

Walt Boyes and the other INSIDER staff are available for speaking engagements, webinars, and workshops. Walt is a member of the Association of Professional Futurists, as well as an ISA Life Fellow and an INSTMC Fellow in the UK. For information, contact Walt at +1 630-639-7090 or waltboyes@spitzerandboyes.com.