

Special  
Double  
Issue!

# INSIDER

INDUSTRIAL AUTOMATION & PROCESS CONTROL

VOLUME 21  
NUMBER 4 and 5  
ISSN2334-0789  
April-May 2017

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INDUSTRIAL AUTOMATION & PROCESS CONTROL

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Your key to the latest industrial automation and process control information

## MCAA: Two Views of the Future of Sensors and the Industrial Internet of Things

"Connecting in an Interconnected World" was the theme of the 2017 Measurement Control and Automation Association (MCAA) Industry Forum held in Atlanta, GA on 23-25 April 2017. There was a balance of presentations and networking time that was attended by about 240 attendees.

### The Large Field Device Manufacturer on Sensors of the Future

Keynote speaker Stephan Neuburger (CEO at Krohne) spoke about *Future Trends in Field Instrumentation for the Process Industry* with a brief history of Krohne dating back to



Stephan Neuburger

1921. Krohne is still family-owned with over 3500 employees, 16 production facilities in 12 countries and a turnover of US \$543 million (2015) striving to be a supplier of innovative products, solutions and services for the process industries. Krohne has recently aligned its organization to meet the needs of global customers by providing consistent scope, consistent service and consistent pricing --- worldwide. In particular, Krohne has a new office and production facility under construction in Beverley, MA.

Expectations for field instrument suppliers include proficiency in and the availa-

bility of many reliable instruments to include the measurement of process parameters (flow, level, pressure and temperature) and substance composition (analyzers --- inline and online) with safety and process optimization via built-in diagnostic functions. Stephan referred to this as the 4+1 concept (flow, level, pressure, temperature + analysis) and cited a core competency in calibrating these instruments. Over and above these measurements, system solutions include metering systems / LACT units, and pipeline leak detection and localization systems.

New requirements for field instrumentation include safety (SIL and non-SIL in one device), availability (diagnostics and predictive maintenance), flexibility (standard devices with a wide range of applications with integral communications and IIoT readiness) and efficiency (seamless integration into plant lifecycle concepts) plus additional requirements of access to data and trends as well as information about the state of the process.

Future trends and technologies include network architectures such as NAMUR and additional functionality such as collecting and assessing information on product properties and comparing measurements with a mathematical model of the application. Stephan said the "sensors of tomorrow will provide diagnosis: they will recognize information and network with each other intelligently and draw the right conclusions."

Enabling technologies include entrained gas management for Coriolis mass flowmeters, magnetic resonance multi-phase flowmeters (developed with Shell and Southwest Research Institute) that simultaneously measure substance-specific oil, gas and water in upstream oil applications, and pipeline leak detection and localization systems that integrate physical sensors, soft sensors, mathe-

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Want to know the **Mind of the Customer™**? Do you know why your customers buy and why they buy specific products or services, and don't buy others? If you don't know, call us to find out how we can help you! Call **Walt Boyes** at +1-630-639-7090.

## MCAA (continued)

matical process knowledge and application knowledge. Krohne has also developed a micro flame ionization detector and micro mass spectrometer on chips to effectively “move the laboratory into the field”. Work is proceeding to monitor processes in real time using impedance tomography.

Steve Pflantz (Associate at CRB Engineering and ISA President) gave a presentation on *Improving Relationships with Engineering Firms* for large projects. There are typically three (or more) parties involved in these relationships --- each of which has its own interests at heart. A&E firms ostensibly work for the client... but they can also be influenced by the vendor, profit... For example, an A&E firm’s purchasing discount dependent upon volume could sway the firm to suggest a particular vendor in order to reach a better discount (and make more profit).



ISA's Steve Pflantz

Steve suggested that trust between the customer, A&E firm and vendors is key to a long-term successful relationship. Further, it is important for the participants to be fairly compensated --- but this is not always the case citing instances where various resources were simply not available to projects because these resources would not be compensated at all due to contract terms, territory limitations... On the other hand, there was one local vendor who Steve “hated” to call because the vendor knew that he would not receive compensation but yet would give Steve his full support.

tiple manufacturers and multiple representatives can be complex. Yet companies deal with products, price, promotion and place in different ways to streamline and simplify these relationships. Organizations typically have people (vice presidents) addressing products, price and promotion but no one addressing place. For example, depending upon the product and its applications, it might make sense segment the market and sell directly to industry and large customers but use distributors for everything else.



Bob Segal

Setting up a distributor organization involves aligning the strategic goals of the distributor with the strategic goals of the manufacturer, agreeing upon who does what in the relationship and ensuring each receives reasonable compensation. Therefore it is incumbent to have a formal compensation program whether based on a flat percentage, volume, function and/or a matrix of these. Barriers to this partnership include poor understanding of channel strategy, delegation of channel strategy to the sales force, lack of channel management training/process, focus on volume and not functions, inattention to channel conflict issues and a poor choice of partners. Note that the first two items refer to place.

Channel partnerships are more important than ever but they also present unique challenges on multiple fronts taking significant care to establish, nurture and ensure that compensation reflects the roles played. Online sales is a growing issue but multiple policies/strategies exist to manage online opportunities and conflicts.



Suppliers Panel on IIoT Trends

A panel consisting of Phil Hunt (President at Adaptive Wireless Solutions), Kirk King (Vice President of Marketing at Endress+Hauser), Vinny Micheroni (Vice President at Schneider Electric) and Stephan Neuburger (CEO at Krohne) discussed *Instrumentation Trends in an IIoT World: A Supplier's View* and was moderated by Matt Carrara (Vice President / General Manager at Schneider Electric).  
WHB

Bob Segal (Principal at Frank Lynn & Associates) discussed *Building Strong Manufacturer-Channel Partnerships in a Complex World* citing that the interrelationships between mul-

*Improving Your Organization's Innovativeness through 'Design Thinking' Practices* was the subject of a presentation by Varun Nagaraj (President and CEO at Sierra Monitor). Innovation can be



Varun Nagaraj

defined as the introduction of something new such as a new idea, method or device that provides value. There are lots of innovative opportunities but also lots of threats. In particular, disruptive technology with lower performance can improve quickly and become “good enough” to displace existing technology.

We must innovate but novelty is unfamiliar and uncomfortable so the organization tends to not “get it”, push back and deprioritize. Portfolio Mindfulness tends to reduce innovation by undermining (reprioritizing) that often unconsciously creates cognitive bias with its systematic think-

## MCAA (continued)

ing resulting from mental shortcuts and heuristics --- often in the presence of contrary information. Cognitive biases that compromise decisions include sunk cost bias (stay on the same track because resources have already been invested in that path), confirmation bias (cherry picking information that supports beliefs and expectations), projection bias (tendency to over-estimate the extent to which the future will resemble the present), availability bias (tendency to prefer what is familiar, easy to imagine and what easily comes to mind).

Design Thinking tends to counter innovation-inhibiting biases by interrelating different perspectives, seeking and integrating different perspectives and focusing on the problem with iterative validation. Design thinking creates innovators rather than just innovation. Design Thinking practices include empathetic (focus on customer fit), iteration (experiment, learn and evolve), generative (open-mindedness and creatively connecting the dots) and representational (emphasis on visual and tangible).

### The Other View of Sensors in the Future

Nagaraj's discussion, coupled with some earlier discussion in the Suppliers panel, suggested that there might be a different view to that of Krohne's Neuburger, that expensive, accurate, and traditional instruments were here to stay—coupled of course, with what Neuburger called “a second channel” to the IIoT. While this might be the great hope of the large instrument vendors, the pressure from simple, less accurate, highly reliable and very inexpensive COTS sensors is already being felt. Industrial grade pressure and temperature sensors are already available for under \$100. Phil Hunt's AWS Genesis product line, for example, can acquire data from these Bluetooth Low Energy broadcast sensors and integrate it into a WirelessHART network. This kind of radical sensor design is not something off in the future.



A panel moderated by Byron Atkinson (President at Boost Design) to discuss *Social Media – Industry Disconnect* consisted of Michelle Bunte (Vice President of Marketing at SOR), Tanya Donnelly (Global Social Media Director at Schneider Electric) and Michael Gallagher (President and CEO at Centro). All of the participants endorsed the development of a formal digital marketing strategy. The company website is only one way to reach people. In particular, the next generation does not like e-mail but does want to be communicated to via social media which can be the “silo buster” that enables communication within and outside the company. Sites such as LinkedIn and Facebook can be a valuable resource in helping locate persons who purchase equipment.

### MCAA Hall of Fame Inductees for 2017

Robert Deane (Co-Founder at Fluid Components), Malcolm McQueen (Co-Founder at Fluid Components) and, posthumously, Judy Stevenson (Owner at Magnetrol) were inducted into the MCAA Hall of Fame.

### Flow Control magazine hands out Innovation Award

The winner of the 2016 Flow Control magazine Innovation Award was Voegtlin Instruments for its red-y compact 2 series thermal mass flowmeter.



Honorable Mention awards were presented to Endress+Hauser for the Micropilot FMR10/FMR20 non-contact radar level device, Sierra Instruments for the InnovaMass 240i/241i iSeries thermal mass flowmeter and Siemens Process Instruments for the HydroRanger 200 ultrasonic level controller.

Don Hutson (President at US Learning) spoke about *21<sup>st</sup> Century Leadership* where motivation was defined as the pull of anticipation and the push of discipline. Don suggested that it is important to put mindset before skillset where a positive attitude is paramount (and the skills can be taught). The components of progress include buy in, tracking trends, embracing change and adapting vigorously. The learning and development model consists of five phases --- energized beginner, reluctant novice, tentative performer, competent producer and internalized pro. Don defined leadership as the art of using persuasive skills and/or the power of position to influence the attitudes and behavior of others toward exceptional performance. The “Theory H” leadership style entails earned loyalty, superb communication flow, being available and interacting, catch them doing something right, making promises reservedly and keeping them and being a skilled performance coach.



Don Hutson

Don also suggesting the leveraging all seven types of differentiation --- product, experiential, relationship, process, technological, marketing and (finally) price. If you know what the ‘dominant value points’ are, you will know how to tailor



## MCAA (continued); The *INSIDER*'s April-May 2017 Roundup

and differentiate your solution. An interesting customer service factoid is that when you make someone happy they tell 3 people but when they are unhappy they tell 11.

### Is There an App for That?

Tom Fiske (Principal Technology Strategist at Yokogawa) addressed the question of *30 Years Experience, Is There an App for That?* We are now at an inflection point where the Boomers (and their knowledge) are leaving the workforce, GenX has peaked and the number of Millennials is increasing. Companies must adapt to meet the needs of Millennials to increase their productivity and retain them.



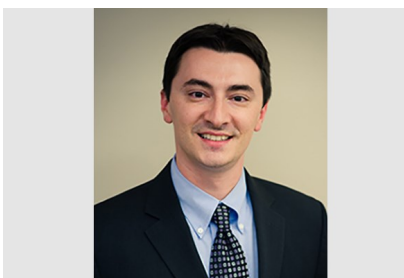
Yokogawa's Tom Fiske

Millennials are digital natives and generally do not want to learn from Boomers because they can find all of the information they need online. They expect to be trained continuously and learn by collaboration. Similarly, communication and problem-solving is collaborative and decision-making is team oriented. Leadership style is that of a partner and feedback is on demand. Changing jobs is the norm. As a result, Millennials do not assimilate well in a Boomer culture because their tendencies and motivations are different.

There may not be an app to capture 30 years of experience but much of that knowledge has been captured and preserved such as Standard Operating Procedures in the aviation industry.

### ITR's Industry Forecast

Alex Chausovsky (Senior Analyst at ITR Economics) took some time to explain the ITR Economics approach to analysis before delving into the ITR forecast based largely on leading indicators. Overall, the industry outlook calls for the USA GDP to change by +3.7%, +1.7% and -1.9% in 2017, 2018 and 2019 respectively where consumer, government and business investment spending represents approximately 66%, 18% and 16% of USA GDP respectively. The USA Industrial Production is expected to change by +2.5%, +0.5% and -0.7% in 2017, 2018 and 2019 respectively which is indicative of a slowing economy. Most North American market segments are forecast to grow in 2017



Alex Chausovsky of ITR Economics

with the notable exceptions of electric power generation production and water and sewer facility construction.

Actionable takeaways include budgeting for continued economic growth through 2019, be willing to take risks, consider opportunistic business and capital acquisitions, add new products, make sure that your training and retention programs are top notch and budget for higher wages and input costs (raise your prices).

## The *INSIDER*'s April-May 2017 Roundup

### Operation Carwash Grows in Brazil

The *INSIDER* has been reporting on the tragic corruption scandal in Brazil that began when it was discovered that Petrobras officials were taking and paying huge bribes, as were, apparently, members of the Brazilian cabinet and legislature.

Apparently the scandal has become so wide-spread that it has attracted the attention of the CBS news magazine, "60 Minutes," which aired a long segment on Operation Carwash, as the investigation is known, in Brazil.



The investigation now touches the last three Brazilian presidents, Lula da Silva, Dilma Rousseff, and now current president Temer, who is accused of conspiring to impede the investigation, and once again, taking bribes.

As long as Operation Carwash continues, it is doubtful that Petrobras will re-start the stalled projects and once again become one of the largest purchasers of automation and instrumentation systems in the world.

### CSIA holds 2017 Executive Conference in Fort Lauderdale

Just shy of an all-time record attendance, 530 system integration industry professionals from 16 different countries attended the Control System Integrators Association (CSIA) Executive Conference in Fort Lauderdale, Florida, May 2-5, 2017.

The Executive Conference featured 20 workshops and sessions, as well as several special events including the second

## The INSIDER's April-May 2017 Roundup

annual CSIA Fun Run/Walk, the CSIA Women in Industry networking breakfast, the annual Industry Expo, and the Awards Dinner.

Among the stand-out sessions during the three-day meeting was a presentation from Alan Beaulieu, president of ITR Economics. A popular annual speaker, Beaulieu gave a clear presentation of the world's economic realities while leaving attendees with a solid, positive outlook for their future.

Two programming tracks were offered:

### Track 1: Small Company SIs and Best Practices

CSIA's Best Practices have helped hundreds of system integrators grow from younger, smaller companies into the well-established ones they are today. Attendees learned how they, too, can use CSIA Best Practices for growth.

### Track 2: Transformative Business Models

Technology is creating a very exciting future filled with opportunity for SIs. These opportunities represent a shift away from traditional SI business models. SIs received opportunities to gain an understanding of how to take advantage of these emerging models.

A two-day *Best Practices Training* workshop was held immediately preceding the Conference for those interested in learning more about the application of the principles behind CSIA's Best Practices and Benchmarking manual, which in turn lays the groundwork for CSIA's signature Certification program. CSIA's 2018 Executive Conference will be held April 24-27 in San Francisco, California, United States.

### CSIA awards recognize contributions to the system integration industry

During the annual Awards Dinner at the Executive Conference, CSIA recognized five outstanding organizations and individuals for their contributions to the system integration industry.

- **Interstates Control Systems, Inc.**, Sioux Falls, South Dakota, United States, was named *2017 Integrator Company Member of the Year*.
- **Kepware**, Portland, Maine, United States, was recognized as *2017 Partner Company Member of the Year*.
- The *2017 Rising Star* award was presented to **Timothy D.C. Nolan, Data Science Automation**, Pittsburgh, Pennsylvania, United States.
- **Robert Lowe, Loman Control Systems, Inc.**, Lancaster, Pennsylvania, United States, received the *2017 Charlie Bergman Award*. The *Charlie Bergman "Remember Me" Award*, named in honor of CSIA founder and visionary, Charlie Bergman, remains the highest distinction for CSIA members. This award recognizes a member for upholding the principles of sharing, leadership and promoting the profession.
- New this year, the *Social Responsibility Award* was presented to **Leidos**, Walled Lake, Michigan, United States.

### Hannover Messe 2017: Insights from IHS Markit

Alex West, Principal Analyst for the Manufacturing Technology Group at IHS Markit provides some thoughts from his attendance at Hannover Messe 2017.

### General industry outlook: growth amid muddled global politics

A whiff of uncertainty is in the air for the industrial market this year as it tries to reconcile seemingly opposing currents at work. On the one hand, a tumultuous global political climate—first from a shocking Brexit, followed by chaotic elections in the US—has served to upend expectations and unsettle business.



IHS' Alex West

Yet an upbeat industry outlook is expected in the second half this year and also in 2018 for products closely linked to the oil and gas industry, such as motors or drives, as the once-beleaguered energy space recovers and moves back to positive growth territory.

Overall, a number of themes could be discerned at the show this year, including cost-cutting, production efficiency, downtime reduction, quicker time-to-market, product customization, and lower development costs.

The themes reflect a blunt, no-nonsense approach to business, reflective of a market landscape coming to grips with slower growth. The industrial automation space managed to expand a slight 0.6% in 2016 following a disastrous contraction of -4.0% a year earlier. This year, the market is projected to grow a modest 1.5%, IHS Markit forecasts.

### Delight tempered with caution

Among event participants, elation about new technologies and their attendant benefits mixed with calls for greater responsiveness to current challenges faced by the market.

Microsoft, for instance, was positive on what lies ahead, believing that the intelligent factory—once simply a theoretical, idealistic framework—is now turning out to be a reality.

For its part, Tetra Pak was buoyed by new digital tools that enable the company's cloud-connected machines to predict exactly when equipment would need maintenance, averting many potential breakdowns in the process. The company started a six-month trial in early 2016 of conditioning monitoring, supporting 11 customer lines with the new service. Results

## The *INSIDER*'s April-May 2017 Roundup (continued)

show that downtime during this period was eliminated by up to 48 hours for each packaging line, saving up to 30,000 euros for customers.

But for capital equipment including pumps, compressors, motors, and generators, the plea was for suppliers to understand the importance of designing full systems in order to meet very specific end-use applications from clients—a point that IHS Markit has continually underscored. To be sure, suppliers have struggled to convince end users of the benefits of higher-cost “smarter” equipment, such as fully connected motor-driven systems that can predict as well as prevent maintenance costs and energy loss. And this year at the show, end users appeared more favorably disposed toward implementing smart, connected equipment provided by the manufacturers that users felt had the capacity to understand their applications as well as provide maintenance, repair, and replacement.

### What's new—and what isn't

In recent years at Hannover many motor suppliers had touted high-efficiency motors, emphasizing energy savings. End users still care about that aspect, but of more importance to them at present is the principle of savings—even if it means spending more upfront in order to prevent expensive operating costs down the road. And while energy efficiency is important, average gains in efficiency of 2% pale in comparison considerably to the millions that can be saved through thoughtful investment in smarter products at the outset, subsequently minimizing downtime and curtailing unnecessary product or parts replacement in the future.

This particular idea—about spending now to save in the future—is not new. However, what is new and different this time is that the view is finally taking shape in industrial automation. Even so, companies remain extremely cost-sensitive, and not a great deal of investment is taking place on new ventures. And while greenfield endeavors are likely to embrace automation and other new technologies, adoption by heavy industries is especially slow given the scarcity of new projects available with the current economy.

Also this year, Hannover Messe 2017 confirmed a trend that many know to have taken root: that more sensors are being embedded in rotating equipment, such as motors, bearings, pumps, and generators.

ABB once again highlighted its smart sensors, which are built on the outside of LV motors with embedded vibration and temperature sensors possessing Bluetooth connectivity. Analytics is performed in the cloud and displayed on an app.

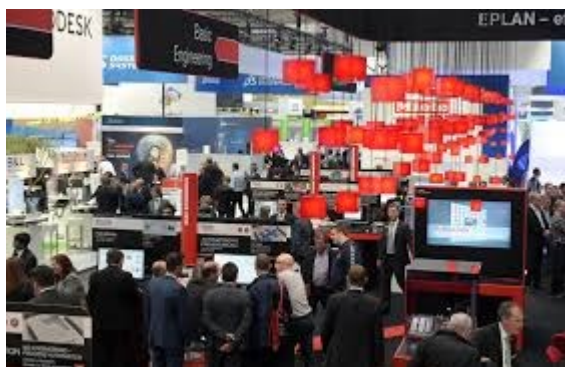
Schaeffler/FAG announced a new version of VarioSense, its intelligent bearing. Aside from speed and temperature, the new bearing includes a vibration and load sensor.

NTN-SNR presented MonitorIT, a condition monitoring system with a magnetic sensor that checks for imbalances and misalignments in bearings and gears. The system has been tested on wind turbines and railways.

Microsoft announced Azure Stream Analytics on edge device, intended to bring analytical intelligence closer to the IoT devices.

The show also made clear that apps will be a focal point in business models for companies to try to own. Firms like Siemens, GE, and Schneider Electric will look to support external app developers working on solutions in addition to internally developed apps, in hopes of utilizing the former on their respective platforms—namely, Mindsphere, Predix, and EcoStruxure. Ongoing discussions of how companies are building out their ecosystem of partners toward a complete portfolio can be found on the [Hannover Messe website](#).

### OPC UA and other cloud connectivity messaging solutions



Software was the big thing at Hannover Messe

For the manufacturing industry, Microsoft is evolving its support of Open Platform Communications Unified Architecture (OPC UA), the machine-to-machine communications standard for industrial automation. Microsoft said manufacturers can use OPC UA to pre-configure factory devices from the cloud, via its Azure IoT Connected Factory solution.

The company also announced Microsoft IoT Central, a new software-as-a-service (SaaS) offering, which it said could potentially increase the speed at which manufacturers can innovate and bring new products to market, while also lowering the barrier to creating IoT solutions that could help generate new revenue opportunities.

All told, OPC UA will work with the forthcoming Time-Sensitive Networking (TSN) standard to support real-time communication between the factory floor and the cloud, possibly supporting a shift in control products to the cloud.

### Opto 22 Joins Linux Foundation



## The INSIDER's April-May 2017 Roundup (continued)

Industrial automation manufacturer Opto 22 announced in April that it has joined The Linux Foundation as a Silver Level member. As a Linux Foundation member, Opto 22 will help support the greatest shared technology resources in history, while also accelerating the company's technology and innovation through open-source leadership and participation. In joining The Linux Foundation, Opto 22 hopes to spearhead the adoption of open-



Linux' Woster

source technology in the industrial automation and process control



industries, and accelerate the rollout of Industrial Internet of Things applications.

"It's exciting to see a vendor from a traditionally proprietary technology space such as industrial automation and process control join The Linux Foundation. It is a testament to the power of open-source technology and the community that supports it and allows it to thrive," said Mike Woster, COO of The Linux Foundation.

"When businesses choose to leverage open-source software, they are in effect choosing to free themselves of the painful pitfall of vendor lock-in. Customers who choose to adopt a product built around a proprietary technology stack are at the mercy of their vendor," says Benson Hougland, VP of Marketing and Product Strategy for Opto 22. "It's time to start driving our product toward a development strategy that liberates customers from vendor lock-in and gives them a choice of vendors to work with."

### Comau Wins GM Innovation Award and Commercializes an Industry 4.0 Capable AGV

Comau was named a GM Innovation Award winner during General Motors' 25th annual Supplier of the Year awards ceremony held Friday, March 31 in Orlando, Fla.

GM's Innovation Award recognizes the top suppliers among thousands of global contenders that introduced innovations that benefit customers. Comau was named one of eight 2016 Innovation Award winners for creating a flexible robotic body assembly framing system for pre-production operations, based on the use of Comau's standard products that have been adapted by General Motors. The solution will allow pre-production vehicles to be more easily manufactured using similar tooling and processes as they would in actual operations, thereby improving future vehicle launch quality.

"Throughout our long term relationship with GM, Comau has been recognized as a leader in innovation in the automotive industry. This award is proof that the continuous investments we make in our people and in R&D, are paying off," said Dave Fett, Head of Automation Systems NAFTA.

During the event, GM recognized 118 of its best suppliers from 15 countries that have consistently exceeded GM's expectations, created outstanding value or introduced innovations to the company.

GM recognized the most suppliers since debuting the Supplier of the Year event in 1992. More than half are repeat Supplier of the Year winners from 2015.

"We are focused on building positive supplier relationships, bringing new, customer-centric innovations to GM and being the OEM of choice among suppliers," said Steve Kiefer, GM vice president, Global Purchasing and Supply Chain. "The companies we recognize this year have brought innovation with the quality our customers deserve."

Comau has commercialized an innovative AGV (Automated Guided Vehicle) platform that is flexible enough to be deployed across a wide range of manufacturing and non-manufacturing scenarios. Agile1500 is the first automated guided vehicle within the new AGV platform and fully expresses Comau's open automation design approach.

Modular, scalable and completely re-configurable, Agile1500 can carry up to 1,500 kg with a maximum speed of 1.7 m/s. Thanks to these characteristics, the new AGV can significantly facilitate core operations including just-in-time and just-in-sequence production, as well as optimized logistic flows inside the factory, improved warehouse management and better overall production efficiency.

Agile1500 has key role in the development of a new operating platform imposed by Industry 4.0. It can increase the overall plant safety thanks to advanced security features and an integrated laser scanner that stops the AGV upon detection of an obstacle along its route.

Agile1500 is a standard product that is also highly configurable. In addition, it can be fitted with different accessories that enhance its performance, as required by each specific application. For this reason, the versatility of Agile1500 can easily

## The *INSIDER*'s April-May 2017 Roundup (continued)

accommodate diverse manufacturing needs and factory layouts. Furthermore, Agile1500 works with multiple navigation systems that use both natural landmarks (walls, objects, etc.) as well as predefined points (magnetic spot and magnetic tape).

### Key Benefits:

- Best in-class payload in terms of size/speed ratio
- Complete reconfigurability protects ROI
- Compact design with on-the-spot rotation capabilities
- Powerful system management software handles transport orders, allocates vehicles and monitors the entire AGV fleet
- AGV can easily interface with other automation systems present in the factory

Agile1500 is Comau's response to evolving market needs and is an important enabler of within the Industry 4.0 paradigm. This fully automated logistics technology enables Comau to better support highly individualized, highly efficient production while safeguarding productivity and profitability of the customer's entire manufacturing line.

### PAS Closes \$40 million investment, and reorganizes

PAS announced in April that they have secured a \$40 million growth investment by Tinicum, L.P. and certain affiliated funds managed by Tinicum Incorporated ("Tinicum"). Tinicum is a private investment partnership focused on late stage investments in manufacturing, energy, technology, media, and infrastructure.

This funding round will expand PAS sales and marketing across its global offices as well as increase research and development for Cyber Integrity™, its flagship cybersecurity software product. Cyber Integrity protects critical infrastructure from risks associated with rising industrial internet of things (IoT) adoption, malicious cyber attacks, and insider threats.

"Critical infrastructure is vulnerable to outsider cyber attacks and to malicious or unintended insider actions," says Trip Zedlitz, partner at Tinicum. "The cyber assets that matter most—the ones primarily responsible for safety and production in power generation plants, chemical facilities, and refineries—are some of the most insecure systems in the industry today. We invested in PAS because they secure this class of endpoints in a way that no other ICS cybersecurity software solution in the market can do, and they help companies comply with a growing regulatory and standards landscape that includes NERC CIP, NIST, and IEC 62443. With a strong management team and the rising global demand for critical infrastructure cybersecurity, we are excited about our investment in PAS."

Industrial control systems have a responsibility for running critical infrastructure safely and reliably. These systems have traditionally relied on complexity, air gapping, and perimeter-based defenses to remain secure. Such strategies have proven largely unreliable and porous. PAS Cyber Integrity deciphers the complex, proprietary configurations of control systems giving companies complete visibility into critical cyber assets. It also identifies unauthorized changes, exposes vulnerabilities, drives compliance, and helps facilities recover rapidly in the event of a worst-case scenario. Cyber Integrity works across the heterogeneous automation environment, providing enterprise scalability, performance, and platform independence.

"PAS has a 23-year tradition of making industrial process facilities safer and more reliable," says Eddie Habibi, founder and CEO at PAS. "Our deep expertise in control systems and production-centric



PAS founder Eddie Habibi

approach to securing ICS give us a formidable competitive advantage. The investment from Tinicum enables us to expand our security solutions portfolio, strategically increase our global reach, and continue protecting our customers from an ever-evolving threat landscape."

Signal Hill served as the exclusive financial advisor to PAS on the transaction. In conjunction with the investment, Plant Automation Services, Inc. ("PAS") has reorganized under the new name PAS Global, LLC.

### PARCO Upgrades with Honeywell and UOP

Honeywell announced in April that Pak-Arab Refinery Limited (PARCO) will use technologies from Honeywell UOP and Honeywell Process Solutions to upgrade its Mid-Country Refinery near Multan, Pakistan, enabling it to meet growing domestic demand for cleaner-burning fuels.

The project's Honeywell solutions will include licensing, basic engineering design and other





## The INSIDER's April-May 2017 Roundup (continued)

associated services for a modular Penex™ isomerization unit, which will help make cleaner-burning high-octane gasoline, and a modular Polybed™ PSA system, which will provide a reliable source of high-purity hydrogen. In addition, the project will include automation and controls from Honeywell Process Solutions.

“These Honeywell technologies will address the increasingly urgent need for low-emission transportation fuels under the Pakistani government’s tightening environmental regulations,” said Mike Millard, vice president and general manager of Honeywell UOP’s Process Technology and Equipment business. “PARCO chose to have these technologies delivered as modular equipment rather than in-field construction for faster startup, higher quality and better unit performance.”

The [Penex process](#) is the highest-performing isomerization option available today. It upgrades light naphtha to produce isomerate, a cleaner gasoline blend-stock that contains no benzene, aromatics or olefins. The process uses Honeywell UOP’s portfolio of proven, high-activity isomerization and benzene saturation catalysts. The [Polybed PSA](#) process uses proprietary Honeywell UOP adsorbents to remove impurities at high pressure from hydrogen-containing process streams, allowing hydrogen to be recovered and upgraded to more than 99.9-percent purity to meet refining needs. In addition to recovering and purifying hydrogen from steam reformers and refinery off-gases, the Polybed PSA system can be used to produce hydrogen from other sources such as ethylene off-gas, methanol off-gas and partial-oxidation synthesis gas.

The facility also will use Honeywell’s [Experion Process Knowledge System \(PKS\)](#), which uses a unified automation system and advanced software applications to increase operator productivity and profitability. PARCO chose Honeywell’s technology due to its long record of experience with the company, its proven record of success in Pakistan and its modularization capability for rapid project implementation.

Pak-Arab Refinery Limited (PARCO) is a joint venture between the Government of Pakistan, which holds 60 percent of the venture, and the Emirate of Abu Dhabi, whose 40 percent share is held through the Abu Dhabi Petroleum Investment Company L.L.C. (ADPI), a subsidiary group of International Petroleum Investment Company (IPIC).

PARCO’s major business activities include crude oil refining and transportation, storage and marketing of petroleum products. PARCO, through its own marketing as well as through a joint venture company with TOTAL, is the strategic fuel supplier for Pakistan, and includes Pakistan’s largest refinery, a 2,000-kilometer cross-country pipeline network. The network includes PARCO’s subsidiary PAPCO, a joint venture company of PARCO; Shell; PSO; and TOTAL PARCO Marketing Limited (TPML).

### Emerson Finally Buys Mynah

Emerson announced in May that it has completed the purchase of MYNAH Technologies, a long-time Emerson alliance partner and a leading provider of dynamic simulation and operator train-

ing software. MYNAH’s solutions enable plant engineers and technicians to test and improve process control strategies and train plant operators in offline, real-world scenarios before implementing them in live production. The addition of MYNAH will help support Emerson Automation Solutions and its Operational Certainty™ program designed to help industrial companies achieve top performance. It has been an open secret that Emerson and MYNAH Technologies were very close, so the move is entirely expected.



Jamie Froedge

Solutions.

“Adding MYNAH’s simulation software and expertise allows us to provide customers with more advanced process simulation and training solutions. This will help improve plant performance, safety and profitability by allowing them to fully optimize their human and automation resources,” said Jamie Froedge, president, Process Systems and Solutions, Emerson Automation

MYNAH’s Mimic Simulation Software is currently in use at more than 1,400 sites across 68 countries in industries ranging from hydrocarbon production, refining, chemical, pharmaceutical and biotechnology. The company’s portfolio also has integration solutions that connect Emerson’s DeltaV™ distributed control system and its production improvement capabilities with additional plant systems, helping Emerson meet customer demands for more integration and related plant performance improvements.



Martin Berutti

“We are excited to join Emerson in delivering greater operational value to the process industries” said Martin Berutti, chief operating officer for MYNAH Technologies. “By leveraging Emerson’s vast global network we can help more organizations deal with generational shift changes in the workplace, while improving the performance of industrial plants.”

### Could Industrie 4.0 attract foreign direct investment into Africa?

*Marc Van Pelt explains how the Connected Industries Conference might act as a springboard for socio-economic development in the region.*

By Steven Meyer, editor, SA Instrumentation and Control.

“The Connected Industries Conference has evolved into something much bigger than just an expression of the digital technologies behind the Fourth Industrial Revolution,” says European Chamber of Commerce board member, Marc Van Pelt.

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



Marc Van Pelt

Van Pelt is the managing director of Pepperl+Fuchs in South Africa and sales director Africa. He is also the regional manager Africa of the FieldComm Group and his most recent appointment is to the board of the EU Chamber of Commerce and Industry in Southern Africa (EU Chamber) as the representative for the electrical, electronic and automation industries. Together with his family, he settled in South Africa in 2014.

According to Van Pelt, the idea for the Connected Industries Conference – scheduled to run in parallel with Africa Automation Fair 2017 – was born out of discussions with

Reed Exhibition's Hanli Goncalves, the Society for Automation Instrumentation Measurement and Control (SAIMC) president Oratile Sematle, members of the Industrial Instrumentation Group (IIG), and other industry experts.

"We were all asking the same fundamental questions," he explains. "What will be the nature of automation in the future? And, how well is the South African government, education and manufacturing sector prepared to meet these new challenges?"

It quickly dawned on the group that Africa Automation Fair, the South African industries' premiere biannual automation and control exhibition, provided the perfect foil for the region's first Industrie 4.0 related conference, given that all the major technology suppliers concerned would already have a presence there. What they needed now was someone with the influence and connections to attract the level of attention they had in mind as the draw card. Van Pelt agreed to put the idea to his colleagues at the EU Chamber and German Chamber.

### **Why the EU Chamber?**

The EU Chamber was established at the beginning of 2015 to represent twelve member countries from the European Union with business interests in South Africa. Its mission is to support EU-based companies in advocating towards an attractive investment and business climate in South Africa through policies which duly acknowledge the essential role of responsible foreign direct investment (FDI) to the sustainable and inclusive growth of southern Africa.

"Around eighty percent of the FDI flowing into South Africa originates from the EU," explains Van Pelt, "Also, the 2000 member companies involved are responsible for employing some 500 000 workers locally, both directly and indirectly. It made perfect sense for us to join together and speak with one united voice."

Even though a Business Climate Survey conducted by the EU Chamber in 2016 shows that investor satisfaction has decreased over the last two years, mainly due to uncertainty in the business and political climates, Van Pelt remains an optimist. Despite the negative findings in the survey, by and large, EU investors have increased their turnover and jobs have been created. But the primary reason for his enthusiasm is a project called Horizon 2020.

### **Sub header: What is Horizon 2020?**

It is the largest EU Research and Innovation programme ever with nearly €80 billion of capital available over the seven years from 2014 to 2020. Its pledge is to lead the way in breakthroughs, discoveries and world-firsts by providing the funds needed to take great ideas from the laboratory to the market.

"The best news is that a portion of these funds is within reach for investment in projects in Africa," outlines Van Pelt, in tones that convey both his belief and commitment. "In other words, they are accessible to help South Africa position its economy in the context of the new technologies designed to power the innovation and efficiency that will typify manufacturing in the era of Industrie 4.0."

Van Pelt, along with many other leading industry commentators, believes that the South African economy is unbalanced through the scarcity of companies in the SME sector. "Big business on its own cannot solve the country's unemployment problem," he says. "If you use the developed world as an example, you find that in those economies the SME sector is responsible for a much higher percentage of GDP. This is a healthy situation."

Van Pelt believes that this is where the Black Management Forum (BMF) has a crucial role to play. "The BMF is already working together with the European Mission to identify investment opportunities in SMEs since it supports the idea that the SMEs of tomorrow need to capitalise on new technologies," he explains.

The EU wants to identify the best possible ways to invest the money available through Horizon 2020. An area it has identified is how the smart technologies of Industrie 4.0 can be applied in ways that provide new-age business opportunities for southern Africa's SME sector, while at the same time, providing solutions to some of the continent's socio-economic problems.

Van Pelt gives a practical example. In Kenya much of the cooking in rural communities is done on open coal fires. Due to environmental and safety concerns, there is a strong desire by the authorities to change this to gas in the foreseeable future. However, the average village dweller is unable to afford the cost of the gas bottle, or a complete refill when it runs empty. A local entrepreneur spotted a business opportunity.

## The *INSIDER*'s April-May 2017 Roundup (continued)

The solution that is being tested is a gas bottle with a solar powered solenoid valve that acts as a dispenser initiated by a signal received over the cellular network. "Strangely enough even the poorest village dwellers in Kenya all have access to a cell phone," says Van Pelt. "Now, whenever they wish to prepare a meal, they simply send a text to the service provider. If their account is in credit, a signal is sent back to the sim card in the dispenser and the gas bottle can then be used for a predetermined amount of time. They can now buy gas everyday on a meal by meal basis, much the same as prepaid electricity. The beauty is how the use of smart technologies like solar panels and cell phones can be used to support basic human needs in areas where there is no other infrastructure."

The EU chamber has a focus on the creation of sustainable technology start-ups that bring the benefits of new technology to Africa's economies. "Skills, plus technology, plus entrepreneurship, equals Uber," asserts Van Pelt.

The hard fact is that the SA manufacturing sector is losing jobs and the textile industry is a prime example. But, as is obvious from Van Pelt's analogy, new technology on its own is only part of the solution to the problem. What is required is a regulatory framework that encourages and supports entrepreneurship. Simultaneously, the education system must be creating a talent pool not simply of 'graduates', but of people equipped with the appropriate skills to capitalise on the benefits of Industrie 4.0 – even though the exact nature of the business opportunity may as yet be undiscovered.

"Government has a role to play, education has a role to play and business has a role to play," outlines Van Pelt. "As the EU Chamber we represent the business interests of our member companies, which would all benefit from a South African economy that was growing as strongly as it could be. This is why we have such keen interest and support for the Connected Industries Conference, since it opens new perspectives for South and Sub-Saharan Africa."

There is interest from government through the DST, the CSIR and the DTI; there is interest from the educators through the ECSA/SAIMC initiative to address the shortage of skilled automation engineers; and there is interest from business through the BMF and the technology suppliers and end users.

In fact, this interest has reached such a level that EU ambassador Dr Marcus Cornaro has confirmed as one of the keynote speakers at the Gala Dinner to be held on the first evening of the conference. Van Pelt says that Garth Strachan (Deputy Director General: Industrial Development Division of Trade and Industry) and Germany's Matthias Machnig (State Secretary, Federal Ministry for Economic Affairs and Energy) have also been invited to participate.

"The Connected Industries Conference is the first step, but it's what comes afterwards that will really make the difference," says

Van Pelt emphatically. "All the stakeholders in the country's economic machine are key and with the right strategic cooperation South Africa could revitalise its manufacturing industry and SME sector through digitalisation and the ideas of Industrie 4.0 which should also lead to new and more job opportunities"

The Connected Industries Conference takes place at the Ticketpro Dome in Randburg from 6-8 June. Globally, there is now enough conclusive evidence to prove that the technologies of Industrie 4.0 can add significant advantages to industry, and in some cases, even transform the entire operation. Uber, for example, runs the biggest taxi company in the world without owning a single vehicle. With the enthusiasm and commitment of people like the EU Chamber's Marc Van Pelt acting as a link to the benefits available through the EU's Horizon 2020 project, 2017 may just go down in the history books as the year Industrie 4.0 came to Africa.

### **MESA Africa and where it is headed in the fourth industrial era**

*Daniel Spies (chairman MESA Africa) and Gerhard Greef (vice chairman) discuss MESA, standards, and a time of metrics on steroids.*

By Steven Meyer, editor, SA Instrumentation and Control.

MESA (Manufacturing Enterprise Solutions Association) International describes itself as a global community of manufacturers, producers, industry leaders, and solution providers who are focused on driving business results through the intelligent application of manufacturing information. (Essentially, it is the space where manufacturing technology and IT collide.)

The organisation's primary goal is to contribute positively to both the business results and the production processes of its member organisations, which it does through access to a central repository of experiential white papers, as well as guidebooks and knowledge shared through the results of original research. To date this archive contains over 1000 such publications, available only to members.

MESA International is a vendor independent body staffed by a group of volunteers all passionate about continuous improvement in manufacturing through the ideas of asset performance management, lean manufacturing, product lifecycle management, and more recently, the concept of the real-time enterprise. The only paid staff are the president and a handful of administration personnel. MESA Africa is the local chapter and is staffed by volunteers from vendors, system integrators and manufacturers.

### **MES in the early days**

Some eight years ago, Daniel Spies and Gerhard Greef, together with Deon Englebrecht (Rockwell Automation, now in



## The INSIDER's April-May 2017 Roundup (continued)

Australia), organised a 'MES Conference' at the Indaba Hotel that sparked the interest of the local manufacturing fraternity, and ultimately led to the formation of MESA Africa.

Daniel and Gerhard met about ten years back on a large MES project both were involved in at Sappi. "This was back in the days when manufacturers took a 'big bang' approach," explains Daniel. "MES was seen as a 'software suite' and people believed you needed to implement everything in order to get results."

These suites of MES software were very expensive to buy, costing almost as much as the ERP systems of the day. This was a conundrum for Daniel and the team at Sappi as they neither needed all the facets of the functionality, nor did they have the budget to pay for them.



Daniel Spies

"This is when we came across Gerhard at Bytes (now Bytes Universal Systems)," says Daniel thoughtfully. "He had just authored a book titled 'E-Manufacturing and Supply Chain Management', which gave people an accurate insight into the structure and the framework of MES."

This was exactly the orientation that the team at Sappi required. "Now we were in a position to evaluate any of the current MES offerings – from suppliers like Aspen Tech, ABB and Honeywell – and match them against our own specific operational requirements on a cost versus benefit basis," adds Daniel, as the penny begins to drop for the rest of us.

The real value of a vendor agnostic organisation like MESA is found in the extensive networks of expertise members have at their disposal to help them resolve highly specific manufacturing or supply chain related problems. It heralded the dawn of a new era for manufacturing in southern Africa.

The spark of interest that ignited that first conference had become a fire and MESA Africa was born out of the special interest group which gathered at the Indaba hotel that day to share ideas about this 'new technology'.

### **Best of breed solutions emerge**

When the housing bubble burst in 2008, the global economy crashed and the resultant freeze in spending on new IT projects forced a rethink in the way MES projects would be done in the future.

"Our budgets dried up," explains Daniel in measured tones. "We were told to innovate and make do with what we had. It forced us to take a new approach and focus only on that which was relevant to the specific business problem at hand."

Gerhard describes it as the second phase of innovation in MES.

The result was a proliferation of 'Best of breed' solutions that emerged to challenge the aristocracy of the all encompassing 'Dream liners' of the past. These new MES products were agile and tightly targeted towards specific problems, and they could be combined if the functionality of one did not go far enough. The end user community had started to look for good business solutions, rather than just good engineering platforms.



Gerhard Greef

"These days, it is all about solving business problems," emphasises Gerhard, joining the conversation forcefully. "End users now break their problems down into bite (sic) size chunks, and then resolve these in order of priority. There needs to be a measurable cost benefit relationship before they will do anything. The 'Best of Breed' approach however has led to the proliferation of 'point-to-point' interfaces as the need for information sharing increases daily."

### **Standards win the day**

One of the limitations of these nimble new packages is that they cannot integrate effectively unless they are underpinned by an appropriate body of standards.

"A significant benefit that accrued out of the financial crisis is that we were forced to adopt intelligent standards, or we could not continue," contextualises Daniel. "It all hinged on interoperability, which is extremely difficult to achieve without a set of universal standards when both project budget and resources are tightly constrained."

This is one of MESA's most noteworthy contributions to industry. "Systems became ecosystems, which included the company's ERP platform," explains Daniel. "To that end, MESA was instrumental in the development of the ISA 88 and ISA 95 standards, which it did through working groups that operated in conjunction with the various standards committees, as well as overall comment and evaluation when the draft documents were complete."

"Typically a standard gets developed from the top down," adds Gerhard. "Once the basic concepts are defined then the specific activities, transactions and protocols to support it will be developed."

Primarily, this is the level at which MESA makes its contribution. A good example is the cross communication required between systems when a bill of materials update occurs.

"That is an important part of the value that MESA adds," interjects Daniel. "But there is another aspect; ultimately MESA provides guidelines to industry on how best to implement these standards, utilise them effectively, and the level of ROI

## The *INSIDER*'s April-May 2017 Roundup (continued)

that can be expected when they do.”

This might be just the beginning. An emergent new technology – which nobody fully understands yet – promises to disrupt the need for interoperable systems by at least one quantum level in performance. It is known as the Industrial Internet of Things and it is the darling of tech marketers everywhere.

### *So what is this Internet of Things (IoT) anyway?*

Mckinsey defines the IoT as the physical world transformed into an information system through sensors and actuators embedded in physical objects and linked through wired and wireless networks via the Internet Protocol.

“The IoT is something everyone is talking about, but nobody really understands where the value lies,” says Gerhard, laughing a little. “MES was like this too in the early days, until people became more educated about things.”

“End users came to understand that MES is not a silver bullet that can fix any business related problem that exists because of bad manufacturing practices or ineffective business processes,” adds Daniel. “And the same is true of the IoT.”

“The IoT is nothing more than an information sharing framework,” says Gerhard, cutting decisively through the haze of marketing that has clouded the subject for the last few years. “It is a platform for exposing device related data in real-time. If you do not do anything with it, or it is the wrong data, then it has no practical value.”

“MES has been doing this for decades,” explains Daniel, “all that the IoT changes are the depth and breadth of the information, as well as the speed with which the data can be collected and analysed.”

“That’s correct,” agrees Gerhard. “IoT is MES, but extended to the whole world.”

The IoT then is an extremely powerful computer network able to capture vast amounts of real-time manufacturing data, contextualise it, and then present it to management in a way that facilitates decision making designed to improve the organisations profitability.

The value, at least in a manufacturing context, is the richness of the data analytics translated into metrics that are more powerful than anything that has gone before. The key organisational question thus becomes: “If we have a well defined system of manufacturing related metrics in place, what advantages do we have over our competitors who do not?”

“This is an area where MESA is particularly strong,” explains Gerhard. “There are myriads of metrics that can be used to evaluate a factory’s performance. One of the things MESA does is to look at which of those the top quartile is measuring in any partic-

ular industry.

“This is then used to establish how best to develop a proper metrics framework, and, while this may vary from industry to industry, the information is freely available to all registered members. This is a significant benefit to any manufacturer wanting to earn, or keep their place in, that top twenty five percent.”

### *Revelations and such*

While MES is an extremely powerful productivity tool when it is applied correctly, it is not a patchwork quick-fix for a badly designed or outdated manufacturing process. While the IoT is an extremely powerful framework for real-time data capture, it adds no value for manufacturers unless the proper levels of contextualisation and decision making are applied.

The idea of using metrics to leverage a competitive advantage in manufacturing is nothing new. The trick now is to understand how the technologies of MES and the IoT are about to create the disruptive era of ‘metrics on steroids’, and how MESA and standards can help you survive them.

For more information contact Daniel Spies, MESA Africa, +27 (0)83 666 6854, [chairman@mesa-africa.org](mailto:chairman@mesa-africa.org), [www.mesa-africa.org](http://www.mesa-africa.org)

### **Fluke Accelix platform ushers in new era of connected tools and maintenance productivity**

Fluke’s new Accelix cloud platform makes the promise of the industrial internet of things (IIoT) work, connecting plant equipment to enable reliability & maintenance teams to save costs and maximize uptime. The reality is that most plants use offline equipment of varying types and age that is difficult and costly to maintain. To realize the promise of improved productivity, reduced downtime and critical insights, this equipment needs to be monitored and seamlessly tied to plant systems and workforce planning.

Fluke Accelix is an open, cloud platform that connects maintenance software, equipment and critical plant systems. Accelix integrates Fluke’s portfolio of wireless tools and condition monitoring sensors to eMaint, Fluke’s leading SaaS CMMS (Computerized Maintenance Management System), and shares information with enterprise solutions of choice.

Accelix will help maintenance teams access the benefit of connected equipment, tools, measurement data and software systems by eliminating common barriers many customers face to implementing a comprehensive, affordable reliability program.

“The latest trends in maintenance solutions make great promises, yet are often too expensive and time-consuming for most

## The INSIDER's April-May 2017 Roundup (continued)

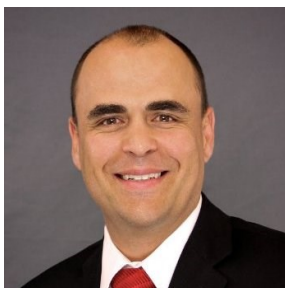
organizations to implement, especially on second- and third-tier equipment,” said Brian Samelson, Fluke’s President of Digital Systems. Mr. Samelson continues, “This means that an overwhelming amount of maintenance activity happens in a black hole. Accelix solves this prevalent problem with a combination of familiar and trusted tools that connect seamlessly and are cost-effective to implement. We have removed the barriers that often separate the promise of advanced technologies from the reality of most maintenance and reliability



Brian Samelson

professionals, for virtually any size operation.”

“Maintenance managers are constantly looking for opportunities to improve productivity, lower costs, and save time. This is increasingly important as teams have fewer resources to do the same job, and they need better insights into resource allocation and asset health,” said Paul de la Port, President of the Industrial Group at Fluke. “Industry data proves when



Paul de la Port

managers can monitor machine health they allocate their teams more effectively and prevent serious problems from happening – all while improving safety, productivity, and uptime. In the end, equipment life is extended and savings are quantified; we believe this value proposition is sought by maintenance professionals everywhere.”

### Cypress Envirosystems’ Big Win



Harry Sim

Some of you may remember that Cypress Envirosystems was a spin-off of Cypress Semiconductor Inc. Then-CEO T. J. Rogers decided to see what his invention closet could do for the industrial market. This was, in retrospect, the first company attempt to begin working in the Internet of Things. Rogers hired Harry Sim away from Honeywell, and Sim began to churn out products. Cypress was the first to develop a wireless steam trap monitor, a wireless pressure gauge, and other wire-

less devices for the industrial environment. In the midst of this, using his experience in temperature measurement in building automation, Sim realized that an Internet of Things approach to building controls would be a unique win for Cypress Envirosystems.

Enter the Wireless Pneumatic Thermostat. This device, installable in about 5 minutes in any existing pneumatic thermostat application, could mesh and perform nearly all of the tasks of much more expensive Direct Digital Control (DDC) systems.

Cypress’ WPT was recently studied by the US General Services Administration and Oak Ridge National Laboratories.

They found that when retrofitted to existing pneumatic control systems, wireless pneumatic thermostats, can deliver much of the benefit of Direct Digital Control (DDC) at a fraction of the cost.

During real-world assessment at the Ronald Reagan Building in Washington, DC, researchers found WPT to be an effective control strategy. Modeled payback, across a range of climates, was between 2-6 years. 20% of GSA buildings could benefit from retrofitting with WPT. Those include multi-story buildings larger than 20,000 square feet, and built before 1999.

This accords well with a non-GSA very high profile example. Zeller Realty Group bought 311 S. Wacker in Chicago, a post-modern icon across the street from the Willis Tower (formerly the Sears Tower) and had to bring its building automation



WPTs at 311 S. Wacker

system up to modern standards. Using Cypress Envirosystems’ WPTs, they did the entire project for under \$900,000— way below what it would have cost to upgrade the entire building to electronic thermostats and building controls.

Local utility ComEd kicked in around \$400,000 as part of its Smart Ideas energy-efficiency program, cutting the cost of the project nearly in half. Taking into account the rebate, the project paid for itself in less than two years, according to Zeller, and the 1.4-million-square-foot office building now achieves more than 30 percent in HVAC energy savings each year.

Disclosure: Walt Boyes served as a member of the Cypress Envirosystems Board for 5 years and holds stock appreciation warrants with the company.

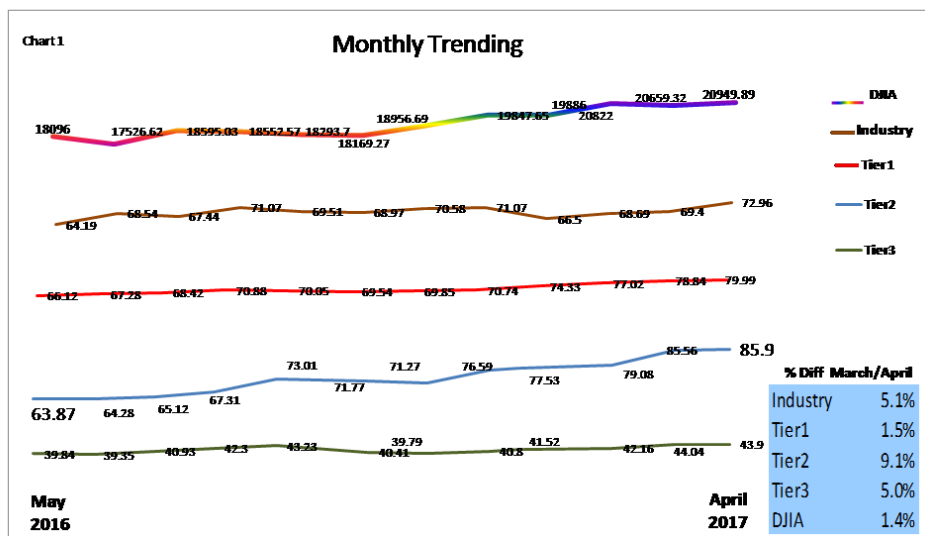


# Mostly holding our own...

# INSIDER

INDUSTRIAL AUTOMATION & PROCESS CONTROL

## Health Watch



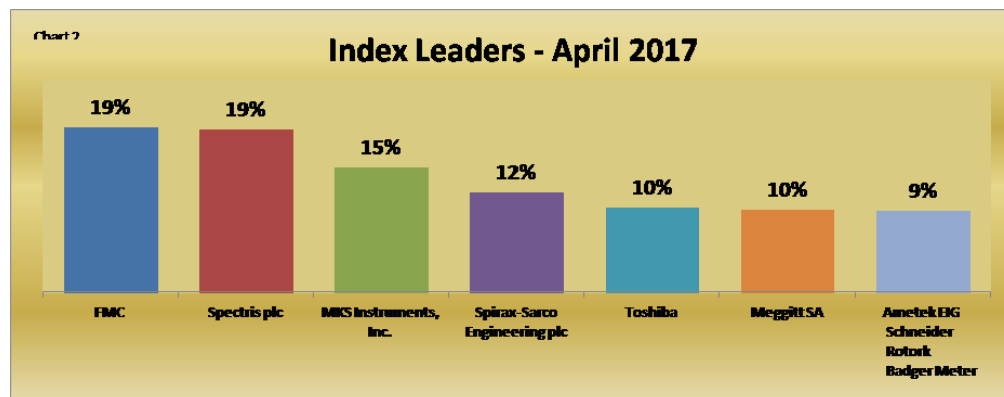
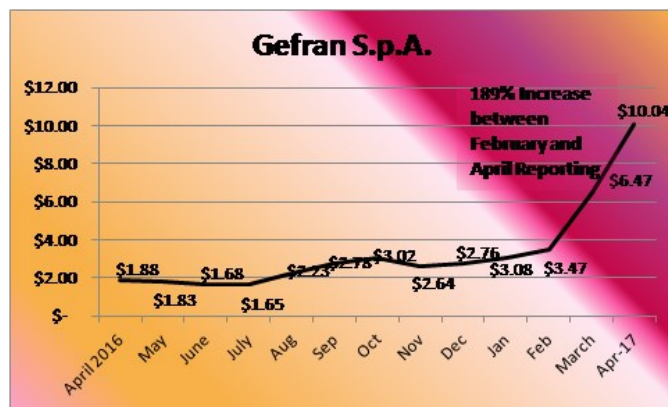
### The Leaders

The companies with the largest gains in April were FMC, Spectris plc, MKS Instruments, Spirax Sarco, Toishiba, Meggitt, and tied at 9%, Ametek, Schneider, Rotork, and Badger Meter. This is interesting because all of these companies are device centric, rather than software centric. It could be that the predicted increases in sensor purchases have already started to happen. This is good news for the Industrial Internet of Things.

Our industry did well overall this month, outperforming the Dow by almost 4%. Tier 1 companies held their own, matching the Dow point for point, while Tier 2 jumped over 9%. Tier 3 was right in line with the industry average, also outperforming the Dow by 4%.

of the global jitters that the elections of Theresa May and Donald Trump have caused. Obviously, if the Conservatives lose the election in Britain, or Trump gets us into a war with North Korea, or elsewhere, all these predictions are off.

This is a good sign that, even though the experts from ITR, who spoke at MCAA and CSIA, predicted a slowing economy, it isn't slowing yet. It will be interesting to see if the trend holds, even in the face



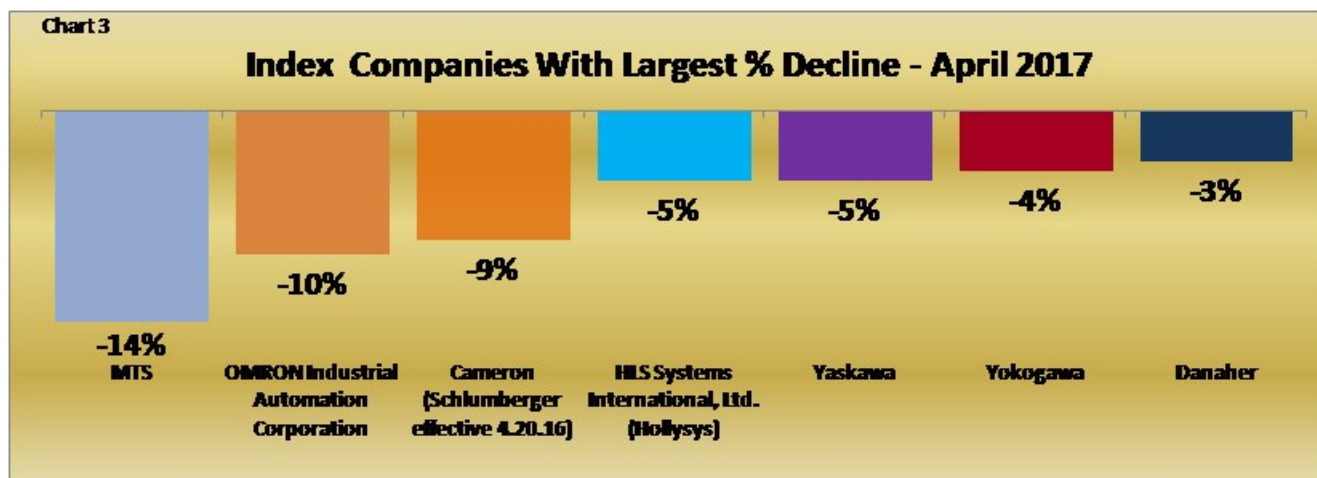
Something interesting is happening to Gefran. As you can see from the chart, Gefran has had a huge increase in value from February through April. It isn't clear why this is happening, and it is something that the INSIDER is watching very carefully.

### Those Less Fortunate

# Mostly Holding Our Own... (continued)

**INSIDER**  
INDUSTRIAL AUTOMATION & PROCESS CONTROL

## Health Watch



We should note that MTS has been in the losers list for the second month in a row, with a loss of 4% last month and 14% this month.

OMRON is next, with a 10% loss, followed by Cameron (Schlumberger effective 4.20.16) and Hollysys. The Schlumberger positioning is based on the continuing fluidity in the price of oil, and the future of offshore drilling. The continuing corruption scandals in Brazil and other countries in South America, since they are centered around oil (Petrobras) and other heavy industries, are making things difficult for the oil field giant.

The continuing softness in the Chinese economy is the explanation *du jour* for the poor performance of Hollysys.

Yaskawa and Yokogawa both suffer from the management struggle known as

“Japaneseness.” Both have tried to “internationalize.” Yaskawa has bought European companies. Yokogawa has started a new trend toward acquiring companies, which they’ve never been very successful at. They have even tried to move R&D out of Japan. It does not appear to be working, however.

Yokogawa’s problems are probably not going to be solved with easy fixes. Despite the excellent design and careful craftsmanship, their field devices do not seem to have the success of their American and European competitors. One issue is that for decades, Yokogawa deliberately understated device performance by as much as 3-5%. When asked, Yokogawa managers answered that they preferred to make accuracy and repeatability statements that would be true even in the worst cases. This is admirable, but is an example of the “Japaneseness” issue. No

American or European company would do this. Yokogawa is not the only Japanese company that has this history.

One wonders if the poor performance of Danaher is a prefiguration of what may be coming if the Republicans in the US Congress succeed in destroying the EPA and environmental monitoring and clean-up. Danaher is heavily involved in instrumentation for the environment, sampling and so forth. It could also be that Danaher is simply seeing a reduction in their Motion Control business, just as Yaskawa’s results might also indicate.

It’s very clear that Trump is not going to bring back any large number of jobs, and the economy is already showing signs of shakiness.

Stay tuned. It may be a bumpy ride.



# THE WAY I SEE IT

## Editorial

### My sincere apologies to our readers...and a thought about the law of unintended consequences

This special double issue is the result of the fact that I was in the hospital for three days in the end of April and early May. When I had heart surgery in early 2015, the surgeon took two vein grafts from my lower legs to become the quadruple bypass (with a cloverleaf and flyover) that healed my heart and gave me good health once again.

Unfortunately, that means that the circulation in my lower legs isn't great, and on the way back from MCAA I was forced to sit in a middle seat between two other large people, and couldn't move my legs for the duration of the flight. This sparked a really bad case of cellulitis, and shot my blood glucose readings to the stratosphere.

A stay in the hospital, with antibiotics both then and after, fixed the cellulitis problem, and the tests I underwent indicate no major problems in the heart department.

But I was out of action for about two weeks, and the April INSIDER simply didn't get done.

Comments? Talk to me!  
waltboyes@spitzerandboyes.com

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

David W. Spitzer and I decided to produce a double issue instead, and you'll notice that this issue is longer than usual. That's because it is a true double issue, with articles from April and May.

But what we have here is an example of the

**This is a lesson that any automation company needs to keep in mind. *Everything* has consequences, and nothing is ever simple.**

law of unintended consequences. My veins made it possible for my heart to work, but left me prone to circulation problems and cellulitis.

This is a lesson that any automation company needs to keep in mind. *Everything* has consequences, and nothing is ever simple. The Republicans are finding out that it is much harder to govern than to be in opposition, and the Democrats are learning what the consequences of cavalierly ignoring the Sanders wing of their own party were: the election of Donald Trump and hardening of the right wing in the United States. As we mentioned when

discussing Danaher's poor performance in the Health Watch this month, we may be seeing unintended consequences from the disestablishmentarianism that has taken over in Washington, with the attempted elimination of environmental controls, and indeed, the entire EPA, OSHA, and the FDA. If there are no regulations, there is no need for environmental remediation or monitoring. If this happens, the automation industry may lose somewhere around 25% of its business. This would be a

touch unintended consequence of the drive toward libertarianism and unfettered capitalism.

So, when we look at new ways to do things, there are always unintended consequences. Vastly increasing the amount of automation, and the concomitant reduction in jobs may increase productivity, agility, and profits, but what will be the costs.

Especially the people costs that we cannot see or easily codify. We hope, but we don't know, that we will create new jobs to replace the old manufacturing jobs that are disappearing into automation. We know that there are hundreds of thousands of displaced workers who are not able to fill those new jobs— but at the same time, we are reducing the social safety net that is all that is keeping those people from living on the street.

Unintended Consequences, it's not just a theory, it's the Law!

*Walt Boyes*



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## Rajabahadur V. Arcot: The Future of Manufacturing

The purpose of all manufacturing, on one hand, is to create value to respective company's shareholders and, on the other, deliver quality commodities / products at the right price & time and thereby ensure customer delight.

Manufacturing is intrinsically linked with the demand fulfillment of people's wants and needs.

On one hand, in order to enhance value to their shareholders, global manufacturing companies are continually on the lookout to expand their presence into markets that, driven by robust consumer spending, are demand-centric.

On the other, manufacturing companies, based on their core businesses and competencies, identify goods and products for which demand exists or likely to arise in future, continually develop and deploy the most appropriate technologies, and establish facilities to produce & distribute them and provide support services.

In the process of meeting these goals, industrial firms strive among others to gain sustainable competitiveness, achieve economies of scale, emerge the best-in-class globally, and collaborate closely with their value chain partners. They invest in enabling technologies, such as plant floor automation systems and corporate level enterprise solutions, to help them achieve business excellence; and such investments are bound to increase in the years to come.

While this trend augurs well both for the manufacturing companies and technology vendors, it may not be good news to those seeking traditional manufacturing jobs. While there is general agreement that creation of jobs is essential for the overall well-being of global

economy and that manufacturing has an important role to play in that, it will be the manufacturing industry that will have the final say in specifying the skills and competencies that it expects from the aspirants desiring to enter the manufacturing industry's job market.

**However, the caveat is that it should desist from being swayed by populist political demands, such as 'bring back lost manufacturing jobs.' I believe the survival instincts of the captains of the industry will finally prevail over clamor.**

Viewed from these perspectives, the global manufacturing industry is performing well and its future seems secure. However, the caveat is that it should desist from being swayed by populist political demands, such as 'bring back lost manufacturing jobs.' I believe the survival instincts of the

captains of the industry will finally prevail over clamor.

### Manufacturing's synergistic links with wealth generation and demand creation & fulfillment

The industrial revolution, through technological inventions & breakthroughs and scientific discoveries, apart from improving the quality of life and productivity of all human endeavors and activities, has contributed immensely to the creation of wealth and disposable incomes that stimulates consumption.

It spurred the ever-increasing demand for aspirational wants that are met by the manufacturing industry. Thus the manufacturing industry, the offshoot of industrial revolution, because of its close links with wealth generation, demand creation and its fulfilment spurs economic development and generates employment opportunities.

Says the McKinsey report "*Manufacturing the future: The next era of global growth and innovation*," manufacturing stands as the tangible expression of innovation and competitiveness and is the route to higher productivity & rising living standards and it makes outsized contributions of trade, research & development.

## Rajabahadur V. Arcot: The Future of Manufacturing (continued...)

It must be recognized that the manufacturing industry's future and its spread beyond the shores of the early beneficiaries of industrialization are important for the overall benefit of humanity and its wellbeing. How important it is can be gleaned from the fact that in the global trade and spending on research & development, manufacturing accounts for almost 70 percent and 90 percent respectively.

Manufacturing industry's hallmark is its track record in achieving continuous productivity improvements, as a consequence of which, the increases in the cost of durable goods is only a fraction of the consumer price inflation and this helps the consumers.

In an article, Jon Rynn, a Visiting Scholar at the CUNY Institute for Urban Systems points out that "it has been the strategic achievement of rich nations to create a high-quality manufacturing sector in order to develop national wealth and power."

Continuing to remain relevant in playing these roles, the manufacturing industry, wherever it spreads, creates quality jobs either directly or in related service sectors. According to some reports the share of service jobs in manufacturing accounts for almost 30 to 55 percent. In future, as the level of automation surges, this share will increase.

Manufacturing industry has been the main driver for the rapid economic rise of many countries, such as England US, Germany, Japan and the USSR initially and later the newly industrialized countries like Korea, Taiwan, and China; it still continues to remain a major wealth multiplier.

According to the World Factbook data as reported on the Statistics Times, in the year 2014, the industry sector's share in the total global GDP was 30.5 percent with China as the largest contributor followed by the US, Japan, and Germany. In value terms the industry sector's contribution to Germany's GDP is close to US\$ 1,170 billion and, either directly or indirectly, accounts for almost 15 million jobs. The share of the manufacturing industries in the GDP of these countries is increasing. The World Bank data shows that the manufacturing output's share in GDP in the case of South Korea and Germany rose from 29 percent to 31 percent and 20 percent to 22 percent respectively during the period 2009 to 2013.

**Manufacturing thrives in demand-centric markets**

**While in hindsight, it may be politically expedient to say said that manufacturing facilities were relocated in China due to labor arbitrage opportunities, the main reason for the initial rush of investments into China was the country's attraction as an incipient but massive demand-centric market.**

While England, Germany, the US and others, where industrial revolution took roots, were the initial beneficiaries, countries such as Korea and Taiwan initially and later China took to manufacturing to achieve economic development.

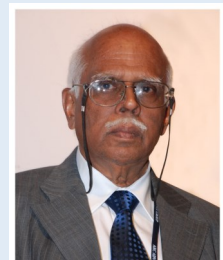
While Korea to a certain extent identified expanding market opportunities for industries, such as automotive & electronics, and largely developed the centers of manufacturing excellence domestically, China opened its economy and attracted foreign companies to invest and set up production facilities in the country. Many global manufacturing companies including automation suppliers, such as Honeywell, Siemens, and others, seeing growth opportunities

that the country offered to expand their footprints and enhance the scale of their operations, invested in China. While in hindsight, it may be politically expedient to say said that manufacturing facilities were relocated in China due to labor arbitrage opportunities, the main reason for the initial rush of investments into China was the country's attraction as an incipient but massive demand-centric market.

China is not an exception, and understandably the lure of other demand-centric markets for manufacturing companies continues. While major advanced economies remain important for manufacturing, the growth opportunities offered by developing countries, such as India, Mexico, Brazil, Indonesia, and others, are more important for the future of the global manufacturing industry and all its stakeholders, companies and countries included.

Virtually all major industrial firms, such as Apple, General Motors, Samsung, Siemens, and Toyota, have strong presence in growing emerging markets because of the consumption growth opportunities that they offer. Initial entrants did attempt exporting completely assembled products including cars, washing machines,

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## Rajabahadur V. Arcot: The Future of Manufacturing (continued)

computing & mobile devices, and such others to the emerging markets, but many of them soon figured out that the best way is to work with local value chain partners to support their growth strategies. Manufacturing companies recognized the benefits of working with local partners spread across continents but closer to consumption centers; and this became manufacturing industry's trend. It is a win-win situation for all - consumers, original equipment suppliers, and their value-chain stakeholders.

The story of India's emergence as an important economic growth engine and the expansion of automotive and consumer electronic goods industry in the country in recent years are illustrative. The demand for cars was very low in India before its economy started looking up. The country was then producing just a few tens of thousands of cars annually; then, it was not an important market for automobile companies.

Suzuki, a little known Japanese car manufacturer in those days with some foresight about the country's future and with the persuasive efforts of the State decided to enter the Indian market through a joint venture company called Maruti Suzuki. The joint venture company began to attract a cluster of part manufacturers which supplied quality parts at competitive prices to Maruti Suzuki. Robust GDP

growth of the Indian economy in the subsequent years spurred the demand for automobiles in the country and the demand continues to expand. As a consequence, global auto majors

such as General Motors, Toyota, Mercedes, Honda and many others have entered the market.

The availability of automotive parts locally has minimized the capital-cost needs for the new entrants and helped them minimize their time-to-market. Suzuki, continuing to enjoy the first mover advantage, has become the top automobile supplier in India and the largest share of revenues for the corporate Japanese company comes from Indian operations!

While Suzuki that recognized India's demand potential and entered the Indian market has immensely benefited, Japanese

manufacturers such as Sony, Hitachi, and others compared to Korean firms such as Samsung and LG, were slow in recognizing the demand potential of the Indian market for televisions, washing machines and such others and delayed their entry.

Currently, Samsung and LG dominate the market in India because of their early entry. Samsung capitalizing on its established brand image is well placed in India's smartphone market, which is one among the fastest growing. Apple, a world leader in this space, is waking up to the reality and is planning to establish production facilities in India.

The moral of the story is clear – as manufacturing evolves it will spread in search of new markets that offer growth opportunities and bring benefits to all its stakeholders. As that happens some jobs, as we know them today, may disappear altogether due to automation which is necessary for productivity improvements in manufacturing.

As the manufacturing industry advances, it will also create new jobs that require high levels of competencies in soft skills, science, technology, engineering and mathematics. According to numerous reports, skill shortage is one among the major issues that confront the manufacturing industry.

This is the other side of the job-losses' narrative. Those who are developing the strategy to *bring back the lost manufacturing jobs* have the additional task of finding answers to the manufacturing industry's skill shortage challenge.



Maruti Suzuki Grand Vitara SUV



Maruti Suzuki assembly line in India

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 IN-STM Fellow in the UK. For information, contact Walt at +1 630-639-7090 or [waltboyes@spitzerandboyes.com](mailto:waltboyes@spitzerandboyes.com).



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