

Peer into the Future: Our Digital Transformation Crystal Ball

The crystal ball is a fitting symbol for digital transformation, since at the core of data analytics and predictive maintenance is being able to see into the future. We may not be looking into this modern crystal ball with the traditional questions about romance or children or adventure, but we are trying to determine how to get rich. With that in mind, we solicited predictions from some of the brightest minds on some of the hottest topics. Join us as we peer into the future...



SmartIndustry

TECHNOLOGY REPORT

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From pondering to modeling in the new year

By Lubor Ptacek, vice president of product marketing at ServiceMax from GE Digital

□ 2018 will see the rise of outcome-based business models across the B2B landscape. Over the past few years, industrial services and manufacturing companies have begun to recognize the strategic advantages that come from a greater investment in service divisions. While for years, it was assumed that selling top of the line products was the premier ingredient for success, in today's hyper competitive climate, companies realize more and more that to be competitive, they need to focus on the overall customer experience. A great customer experience is all about delivering the desired outcome, which usually means uninterrupted,

optimal use of the product. That's where service comes in as the outcome based model has to combine product and service quality. 2018 will be the year of service, and for many companies, field service management technology can help deliver customer outcomes.

Here are some trends we expect to see across industries this year as companies begin to invest more in their service divisions:

Field Service Management (FSM) will reach a tipping point in 2018 and be recognized as a major revenue driver. Effective service is a vital component of digital transformation strategies, enabling a



“One trend to watch in 2018 is the uptake and deployment of wearables, especially devices that move far beyond simple location tracking and which can track personal health data such as body temperature, ergonomic position, and heartrate. Employers will need to look carefully at HIPAA law and union contracts before mandating the use of these devices in the workplace, whether inside or outside the plant walls. Wearable technologies have the potential to be life-savers, but only if organizations effectively thread the needle between corporate safety best practices and data privacy regulations.”

— Thomas Wilk, editor in chief Plant Services



cost-conscious approach to make the ultimate shift to outcome-based business model. According to Gartner, the field service management market will grow at a rate of 21% this year, as more and more companies recognize the value of service.

Both tech companies and industrial manufacturers will be less inclined to outsource service to third party providers, instead tapping into their ability to internalize service and drive new business models by making service an integral component of the company's strategy. No matter where they are on their journey towards outcome-based business models, they want to enjoy the revenues and high margins that service offers; often significantly outpacing the product revenue.

Investment in IoT and analytics technology combined with FSM technology will drive record amounts of productivity from assets. With the reality of zero unplanned downtime on the horizon, investments in IoT and analytics solutions such as APM (Asset performance Management) will take center stage in preventing equipment failure before it occurs, especially in tandem with FSM solutions. APM technology enables real-time analytics on equipment in the field, determining when it is necessary to dispatch a service engineer to deliver maintenance using predictive models. These solutions will hold a vital role in shifting from reactive to predictive service, ultimately ensuring equipment's' uptime and performance at optimal cost. □

The demand for professionals with AI, machine learning, data analytics, and other “smart” skills is growing far faster than the supply. While beneficial for job seekers (because they can be very selective concerning new job opportunities), employers will struggle even more. So, how do you hire top talent? First, you must have a top job. Why should someone leave their current job to come work for you? Second, speed! You’ve got to reach the talent before your competitor does. At Smart Industry Careers, we are now using an artificial intelligence tool to mine both the surface and deep web to identify talent that meets our clients’ requirements because the luxury of time doesn’t exist anymore.

— Dee Holland, senior partner with Smart Industry Careers

Blockchain, traffic and small biz... predictions for 2018

By Michael Kanellos, senior manager of corporate communications and technology analyst with OSIsoft

IOT COMPUTING GETS LOCAL

□ Until recently, the cloud has been at the center of a number of IoT strategies. The operative idea has been that companies would stream machine data to the cloud where it would be organized, analyzed and then returned to the individuals who sent it there in the first place with gleaming insight about factory performance or potential failures. But reality is setting in. Machines simply produce far more data than is practical to send to the cloud. A substantial portion of the data, mean-

embedding data streaming and other technologies into equipment, OEMs and equipment makers can start to “sell” equipment through use contracts.

IIOT MIGHT BECOME IIIOT

Someone threw this acronym at me the other day. It is supposed to stand for Industrial Infrastructure Internet of Things. Hopefully it goes the way of PaaS, which stood for platform as a service but made people think of Paas, the people who make Easter grass.

By embedding data streaming and other technologies into equipment, OEMs and equipment makers can start to “sell” equipment through use contracts.

while, is relevant largely to people located where it was generated. Thus, you’ll see a greater emphasis on storing, managing and analyzing data locally. The cloud will mostly be relevant as a way to share data or to analyze data for ultra-complex projects that require vast amounts of servers.

In some ways, consider this a historical equivalent to the distributed computing revolution of the 1980s. It just makes more sense to stay home.

INTELLIGENT EQUIPMENT COMES OF AGE

Remember those comments on how equipment makers would stop selling airplanes and instead start selling engine miles. The groundwork is now in place. By

SMALL BUSINESS GETS (MORE) INTO THE ACT

Two years ago, things like predictive maintenance technologies were the confines of big companies or larger organizations. But now you’re seeing small utilities such as White House Utility District, which serves around 90,000 people in Tennessee, use IoT for leakage detection. Likewise, MPWIK in Poland, another water utility, is developing analytics to predict when they might get a surge of flushes. Or small companies like SenseOps develop IoT services. Chalk it up to the declining price of technology and the favorable ROI.

TRAFFIC WILL DRIVE THE SMART CITY

It’s the one application everyone cares about.

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As more cities adopt IoT technologies to become smart—thus relying more heavily on digital transactions to operate—we see blockchain technology being used more broadly to put trust into data exchanges of all kinds. A decentralized data structure that monitors and verifies digital transactions, blockchain technology ensures intact, verifiable communications—from a bit of data emitting from air-quality sensors to a transaction between customs agencies at an international port to a connection to remote digital voting equipment. In 2018, we expect that more cities will look to blockchain as a way to secure operations and improve citizen services. Governments around the globe are already adopting blockchain to safeguard the integrity of all types of transactions. The technology could also allow private citizens to participate directly in the delivery of urban services (perhaps renting out private parking spaces or making package deliveries), with blockchain verifying and protecting transactions at the edge of the network, instead of centrally. For all connected organizations, the possibilities are legion for blockchain to improve security, data transparency, and recordkeeping for myriad transactions, and to lend trust to any digital connection.

— Anil Menon, senior vice president and global president (smart+connected communities) with Cisco

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Every product in a critical infrastructure will get the equivalent of a DNA scan.

SUPPLY CHAIN INTEGRITY WILL BECOME A MORE PROMINENT ISSUE IN SECURITY

Utilities, among others, are going to be asking vendors more questions about where their technology was made to ensure against rogue firmware and other security issues. Every product in a critical infrastructure will get the equivalent of a DNA scan.

UTILITIES WILL BECOME... SOFTWARE DEVELOPERS

Utilities have been developing their own technology in-house for decades. Expect to see a number of the leading ones to start to sell them to third parties. Uniper, Germany's mega utility, just got permission to explore ways of selling Tiresias, a homegrown version

diagnostics application, to third parties. Sempra Energy has a first ever subsidiary focused on software called PXISE. Some regulators are looking at allowing utilities to profit from data services. It's potentially a very lucrative data stream.

BLOCKCHAIN WILL BE TALKED ABOUT...A LOT.

But it won't be implemented in huge numbers yet. In the power industry, for instance, it's just too complicated right now. Power is generated pretty much at the same time it's used. You'd need an awfully powerful market to keep up. Similarly, manufacturers are others are just considering opening up their data to other parties, let alone engaging in automated transactions. Most people like the idea but aren't ready to act. ▣

The internet of trust takes center stage

By Joseph Bradley, global vice president—digital & IoT advanced services with Cisco

▣ By 2020, up to 50 billion devices will connect to the IoT, generating data and analytics in support of automated and policy-based decisions. These business decisions will become crucial, shifting the conversation from, “Is the data secure?” to “Is the data correct?” It's this nuance—the Internet of Trust—that will enable tremendous gains in IoT in 2018.

As part of this, blockchain technology will boost IoT in the financial services industry by inherently resisting data corruption. The stakes are going to be much higher, and companies are going to begin to

differentiate around trust. While security will continue to be important, the Internet of Trust will become the key enabler for adoption and, ultimately, success.

The era of convergence: business, social, political—The integration of social, business and political will force companies to enter what was previously known as a “no fly zone.” As competition for technology talent intensifies, silence won't be an option for businesses. Millennials and Generation Z (both that will dominate the U.S. workforce by 2020) will reshape the employment landscape due to their

convictions/expectations that employers demonstrate similar convictions. To maintain a workforce and drive success, companies must to listen to their employee base and apply corporate principles to social and political activities. In 2018 and beyond, “taking a stand” will become the norm as companies hire upcoming generations who thrive on a values-driven corporate culture.

Edge computing will become more prominent—What happens when real-time context is too late for determining consumer behavior patterns—even enterprise behavior patterns? This is where edge computing’s predictive capabilities come in, and why use cases will pop up everywhere in 2018. In just two years, 45 percent of all data created by IoT will be stored, processed, analyzed, and acted upon close to or at the edge of the network. And in just three years, 5.6 billion devices will be connected to an edge computing solution.

Data assets will be the key to success—IDC reports that worldwide revenues for big data and business analytics will grow from nearly USD 122 billion in 2015 to more than USD 187 billion in 2019. However, most companies today don’t own or have access to the data they need to solve the most critical and high value problems. Companies will invest in building out and owning data assets, and once they own the data, they’ll know things about their customers that no one else does. Imagine the power these organization will have to deliver exactly what their customers want and need!

Creating value by asking the right question—From Siri to AI, there’s been a phenomenal growth in computing power over the last 60 years, and U.S. corporations are investing \$350 billion annually in education, mostly centered upon STEM. While these disciplines are important, 2018 will be more than just about figuring data. In a world where all the answers are known, value is found in knowing what question to ask. □

Security will be top of mind—both physical and cyber—for individuals, corporations and nation states. Threats will increase in frequency and intensity demanding an overall increased awareness, proactive risk mitigation strategy and overall commitment to a deeper security-focused framework and process. Why? Unfortunately, evil exists. But good also exists (and there are lots of good people in this world) so let’s stay vigilant and safe.

— Dianne Denison, founder & CEO of Denison Consulting Group

Tackling complexity in 2018: PLM predictions for manufacturers

By Jason Kasper, product marketing manager with Aras Corporation

□ Product complexity was the elephant in the room in 2017, as companies across aerospace and defense, automotive and industrial manufacturing looked to differentiate their offerings and create disruptive business models. These challenges exposed significant gaps in their existing processes. As a result, product

lifecycle management (PLM) found a resurgence as manufacturers recognized the need for a new generation of PLM to manage their product processes—one that legacy systems have failed to provide.

Industry analysts took notice of this new thinking. CIMdata released a formal definition for a “Product



Don't just predict problems—prescribe a solution. That's the premise behind prescriptive maintenance (Rx maintenance), which as a concept goes hand-in-hand with prescriptive analytics. Odds are you'll be hearing these new buzzwords a lot more often in the coming months and years. Rx maintenance is unique in that instead of just predicting impending failure (as predictive maintenance does) it strives to produce outcome-focused recommendations for operations and maintenance from the Rx analytics. Though RxM is still in its infancy, many thought leaders are considering its potential to become the next level of reliability and maintenance best practice.

— Sheila Kennedy, CMRP, Plant Services contributing editor and managing director of Additive Communications



Innovation Platform”—an innovation-enabling business platform that would support all product-related disciplines and users through the entire product lifecycle.

It was a big year for resetting old conceptions of PLM and defining what next-generation PLM can accomplish. So what's on deck for 2018? We have four predictions that could significantly shape manufacturers' businesses in 2018.

Prediction #1: PLM becomes an enterprise platform for innovation

Manufacturers will find even more ways to create value using next-generation PLM product platforms, primarily by addressing the disconnected processes that have arisen from legacy PLM. Today's world is about the business of engineering—the development of smart, connected products that require complex,

is, companies that deliver on their promises to develop next-gen products will be rewarded, and those who have underestimated what it takes to get there will be held accountable. Already, auto manufacturers have put stakes in the ground to deliver Level 4 autonomous cars at scale by 2021. Shareholders have bought into these bold goals. Companies' ability to execute will be tested. We've already seen how this has played out with a company like Tesla.

These organizations that have set high investor expectations tied to next-generation products need to make sure they have the systems and IT infrastructure required to get them there. Today, many of these companies rely heavily on spreadsheets, and they need to ask themselves how successful a path that is to creating shareholder value.

Today's world is about the business of engineering—the development of smart, connected products that require complex, cross-discipline processes and data exchange.

cross-discipline processes and data exchange. Design disciplines across software, electrical and mechanical systems have been siloed for too long. Next-generation PLM is addressing these issues by connecting functions and domains for improved collaboration. We expect leading-edge companies to implement deeper connections to enterprise systems such as ERP and CRM, both internally and with suppliers. Ultimately, the result will be digital transformation that yields a competitive advantage.

Prediction #2: Increasing product complexity will impact shareholder value

Manufacturers' ability to master product complexity will begin to impact shareholder value in 2018. That

Prediction #3: Digital twin moves from marketing term to manufacturing reality

Will 2018 finally be the year digital twin gets some teeth? We've heard a lot of hype at many events about the promise of the digital twin. Every organization seems to have a different viewpoint about what it is and how it can create value. Frankly...it's very confusing and hard to discern exactly how digital twin can be of value to an organization.

We expect this all to come to a head in 2018 as a formal definition of what the digital twin is—and isn't—gets established, as well as the use cases that create value. Digital twin must ultimately convey a range of data sets and context that describe the product

“Many science-driven companies across multiple industries are turning to the cloud as a scalable, secure and transformative research-informatics environment for increasing operational agility, lowering total cost of ownership (TCO) and enhancing collaboration. We see this trend continuing through 2018 as organizations increasingly look to the cloud for a better way to manage the tidal wave of new data types, sources and partnerships engulfing collaborative research today.

— Frederic Bost, senior director (cloud R&D)
with Dassault Systèmes BIOVIA

at a point in time. The question we believe manufacturers will focus on is “Does the digital twin tell me the exact configuration of the asset I am designing, manufacturing and maintaining?”

Prediction #4: MBSE momentum creates shortage of systems-engineering talent

Manufacturers who are building complex products are increasingly turning to Model-Based Systems Engineering (MBSE) to accelerate early design. Pioneered by the aerospace and defense industries, MBSE is gaining momentum in automotive and industrial manufacturing. The good news: MBSE enables systems-level design and improves cross-discipline collaboration. The bad news: the lack

of experienced systems engineers may hinder initial progress.

Why? We have seen previous examples where disciplines gained popularity because of the improvements they brought to manufacturing. Six Sigma is a prime example where organizations quickly found a shortage of “Black Belts” able to manage the processes. The solution was looking from within for people who could be retrained to support the new strategic direction. We expect the same for MBSE. Within the existing major disciplines, we expect software or electronics engineers to be strong candidates for systems-engineering training, particularly as software becomes a larger driver of product functionality. □

2018: The year of BYOD (and the right tools for the job)

By Stacey Epstein, CEO of Zinc

Workers who spend their days out in the field, in front of customers, or on the manufacturing floor—not working in front of a computer every day—are being left out by desk-bound communication tools like email and desktop collaboration apps like Slack. Using mobile devices like smartphones or tablets may be convenient for industrial workers, but can be costly for employers to acquire and manage. The shift to BYOD (Bring Your Own Device) has been underway for the last half-decade, but 2018 is set to be a big year for

the industrial enterprises buying into this movement. Today, all deskless industrial employees have a mobile device in their pocket already; and they are much more comfortable and familiar with using these rather than company-commissioned devices. These employees need enterprise-grade, secure, and private applications to communicate every day on the job.

As we transition into a world of BYOD, businesses will need to create standards and protocols around how employees communicate with each other. For example,



In the coming year, augmented reality (AR) will increasingly enable globally distributed team members to visualize, interact with, and provide feedback on product designs. AR makes it possible for stakeholders to interact with a 3D model of the product, such as walking around it and viewing different states of the model (including going inside the model itself). AR also enables users to get a third-party perspective from other teammates, which is particularly handy for deciphering notes from a colleague as it brings you to the point of view of the model they had when they made the comment.

— Kevin Wrenn, divisional general manager (PLM segment) at PTC.



when a service tech doesn't have all the product parts on-hand, or doesn't know how to fix a problem single-handedly, they should be able to easily communicate with other team members and departments without waiting for access to a computer. Organizations have an imperative to provide purpose-built applications and secure platforms for communication, rather than leaving employees to figure it out by themselves, use rogue mobile apps, or send text messages among themselves.

With an integrated, mobile-first communication app, industry workers have the ability to not only communicate via text, video, and voice calls, but also access documents such as service manuals, work order histories, and new procedures. When deployed in conjunction with the right applications, the use of personal mobile devices inside enterprises with distributed workforces can cut internal costs, streamline workflows, reduce response times, and ultimately lead to higher customer satisfaction and employee engagement.

The shift away from cubicle culture: Remote workers become the new normal

The IDC estimates that deskless workers will account for nearly three-quarters of the U.S. workforce by 2020, and 2018 is poised for huge growth across this demographic. In 2018, the number of deskless workers will be increasing in all fields, including manufacturing, utilities, and other industries that have typically been overlooked by tech innovation. As the number of deskless American employees grows to become a deskless majority, we can expect that solution providers will turn to service the needs of this population. We expect that technology built specifically for industrial enterprises and their remote or field workers will take off this year, and that these new tech applications will facilitate not only a transformative cultural change—with advances in automation and connectivity—but will also improve day-to-day operations for employees on the front lines, including features designed to improve safety, collaboration, and project management. □

Utility providers are a market of one when it comes to software systems, so providers develop solutions in-house to fit their needs. Now, as utility providers look to capitalize on big data, they will increasingly spin off internal applications into viable businesses that use this data to offer extended — and beneficial — services to customers.

— Bill McEvoy, industry principal in the utilities group at OSIsoft

“ More predictions on our digital transformation ”

COMPUTING AT THE EDGE

“Recent research says revenue from the IoT edge will increase by 81 percent in 2018. In other words, the market is starting to awaken to the opportunity for distributed data processing and analytics to occur closer to where IoT data is actually generated. The trend, however, is contingent on two important factors. First, that we begin to see edge assets share information among each other without need for a cloud-based intermediary. Second, companies will need to embrace iOS and Android as the dominant OS for edge system equipment. If these things don't fall into place, the steep ramp everyone is expecting may not come to pass.”

— Timothy Butler, CEO & founder of Tego Inc.

STAFFING THE MODERN MANUFACTURING FACILITY

“To get the millennials on board with industrial jobs in 2018, the industries must address the issues that keep the millennials away. Because millennials were raised with technology, the internet, and social media, they tend to be more collaborative, better at learning new technology, as well as finding new ways to use technology to make adjustments and become more efficient. Work-life balance and flexibility is also more important in the eyes of millennials. Industry is currently unable to allow employees to work remotely (although VR and AR could change that in the future), which makes this type of profession less attractive. This usually makes millennials lean towards web development, programming, digital marketing, and other work-from-anywhere jobs. How does it affect the industrial hiring? At the end of the day, it all comes down to one point – millennials are highly attracted to automated technology. Anything that's doable on a computer or console is superior, while manual labor is seen as a punishment. Industry must rebrand or it will continue to have trouble finding talented millennials to take over and provide leadership.”

— Greg Conrad, writer with Ax Control

DATA ANALYTICS: THE NUMBERS GAME

“Asking us to look into a crystal ball to tell the future is interesting because we already feel that we are living the future of maintenance today. The transformation — whether it’s the IIoT, Industry 4.0, or the new industrial revolution — is rapidly underway. The flexibility of technology leaves no room for barriers. Technicians and reliability engineers can now collect asset measurements however they want, be that with a handheld meter, a wireless sensor, or SCADA or other process data. This multisource information can then be automatically stored in a cloud-based system for future study and analysis in one location. Interoperability is the key to ensuring that plants and other facilities have all the data they need from all their data sources in one place for full evaluation.”

— Kevin Clark, director (global service and alliances
Fluke Accelix) with Fluke Corporation

“In 2017 we saw a swelling of IoT installation and data monitoring. People are really starting to ‘get it’ on what smart industry is, and they’re starting to deploy. In 2018, we expect to see some growth in Industry’s knowledge about their operations, meaning, learning from the data that is being gathered, and applying new efficiency solutions.”

— Darren Tessitore, Industrial Intelligence COO & co-founder

A SHIFT IN POWER

“It’s powerful baby! Manufacturers account for nearly 1/3 of the country’s energy usage, spending over \$200 billion per year to power their facilities. Over 70% of production line disruptions (often costing millions) are due to poor power quality – manufacturers are now realizing this, and are waking up fast to managing and monitoring their power quality. The business cases to invest are obvious with almost immediate impact, making investment in power quality “one of the hottest IIoT business cases in 2018”. Let’s think more broadly, from a strategic perspective. The World Economic Forum rates countries with and without access to high quality power—drawing a direct correlation between industrialization rates and rise of a burgeoning middle class with those countries who have access to high quality power. Mega and multi-national manufacturing firms will increase substantially their focus on maintaining and managing high quality power as a critical, high cost driver in the production process.”

— Dianne Denison, founder & CEO of Denison Consulting Group

DATA-DRIVEN STRATEGIES

“The pace of digitalization is increasing all over the world and in every industry. Driven by cost-effective sensors, linked to really smart mobile devices (including drones), and supported by limitless computer power in the cloud, it seems every week there is another smart, data-driven way of doing something. With my focus on oil & gas, I was struck in 2017 by how quickly this conservative industry went from being slow to change to being driven by digitalization strategies in board rooms. Likewise, reality-modeling technology (turning digital photographs into accurate, usable 3D models) is really taking off in 2018, as this technology enables the existing physical world to be a core part of a digitalization strategy. Reality-modeling enables owners of existing assets to assess current conditions and combine this data with other digital information to make informed business decisions for extending asset life and improving productivity. I expect more automation in this area, with software recognizing and associating assets in a photograph, for example. And I predict advanced machine-learning where the combination of engineering and sensor information can identify the asset, predict issues and turn data into actionable information.”

— Anne-Marie Walters, Bentley marketing director

RETHINKING THE SUPPLY CHAIN

“Changing regulations, especially around food safety in the cold chain, are causing retailers and warehouse companies to rethink the role of IoT in the supply chain. Not only are inexpensive temperature sensors better able to monitor and create accurate records for regulatory reporting, when combined with energy usage and door sensors they can greatly improve operational efficiency, reduce employee time and drive improvements in energy bills, predictive maintenance, food quality, etc. In 2018, we expect to see an exponential increase in the deployment of sensors, connected equipment and location tags (both active & passive), driven by the perfect storm of lower cost sensors from China, improved applications and analytics from Silicon Valley, and innovations in IoT data-fabric platforms that enable companies to start small and rapidly scale across multiple use cases, sensors, application vendors and locations. Distributed-service architecture will support application processing on-site, at the enterprise data center or in the cloud. All in all, there has never been a better time to utilize IoT to drive operational efficiencies and improve the customer experience.”

— RJ Mahadev, head, Kinetic for Retail Solutions Cisco Systems, Inc.

DIY IOT

“Over the course of 2017 we have seen a trend of DIY IoT emerge that we expect to continue into 2018. Many operators, maintenance professionals, and manufacturing IT staff are using low cost, sometimes consumer-grade technologies to enable data capture and visualization, increase safety and traceability, and improve processes. When faced with a challenge, these natural problem-solvers use their ingenuity and inexpensive tools to develop a solution on their own. Whether it’s deploying a platform for data-collection and visualization for an area of the plant that has never had it before, or wiring cameras throughout the plant to improve traceability, these individuals are leveraging low-cost hardware and open protocols to improve processes throughout their manufacturing operations.”

— Jeff Bates, Kepware product manager

PEERING OVER THE EDGE

“Although the IoT is pervasive in consumer technology, the opportunities are just now being realized in industrial applications. The move from programmable logic controllers to PC types of architectures is being spurred on by the next generation of machinery and equipment that needs more intelligence than the traditional PLC micro controller. Factory automation needs real-time connectivity without latency or intermittent connectivity issues, as well as industrial-grade equipment that can handle the factory environment. This requires significantly higher-quality hardware than found in consumer products. 2018’s processors will enable industrial applications to bring connected hardware, data processing, data analytics, and data storage closer to the edge through closer physical proximity. Watch for new, small-form-factor, embedded CPUs that will bring full-featured compact CPUs and industrial, embedded PC products to enable IIoT for factory automation.”

— JC Ramirez, director of engineering at ADL Embedded Solutions

A BUNCH OF THOUGHTS ON CYBERSECURITY

“IoT space gets even messier before it adopts a common framework. Given the difficulty of managing IoT sensors in the absence of standards, most solutions remain proprietary and geared toward solving very purpose-driven functions. Expect proliferating worms to infiltrate many IoT deployments, given the limited computing power of sensors.”

— Aviram Jenik, CEO of Beyond Security

“Heading into 2018 we foresee activity across the spectrum of network cybersecurity, from single endpoint protection to securely moving and protecting data in the cloud. In the industrial world there are significant numbers of high value endpoints (turbines, oil rigs, centrifuges) with low bandwidth requirements that need to be protected; to this end we see both manufacturers and operators looking for a compact, reliable, simple to deploy cybersecurity device. At the other end of the spectrum are the cloud solutions that have the same security requirements, but have to move massive amounts of data. And in between are the plants and facilities that continue to fortify their operations against attacks that can get around normal firewall defenses while maintaining business continuity. Data diodes scale across this spectrum, offering solutions that meet the security, bandwidth and pricing requirements at all points along the spectrum.”

— Scott Coleman, director of marketing & product management with Owl Cyber Defense

“AI and machine learning continue to be trendy terms in security. For years, AI will be nothing more than rudimentary analysis of machine-generated data to track attack patterns and predict the next stage of a sophisticated breach attempt. We are still at the mercy of “man” to interpret machine data in a meaningful way since the volume of false positives and false negatives is still unacceptable and nonactionable. Like other areas of security, AI is a tool that can and will be exploited by the cyberspace dark forces.”

— Hamid Karimi, vice president of business development for Beyond Security

“The industrial cybersecurity space will see record investment in 2018. Cybersecurity has been attracting significant investment for years now, however the bulk of that investment has been in the traditional “IT security” world where the most action is. During 2018, we expect to see a shift where more investment goes toward companies addressing the industrial cybersecurity needs that are becoming critical.”

— Paul Myer, CEO of Veracity Industrial Networks

