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Your key to the latest industrial automation and process control information

Inside this issue:

INSIDER HealthWatch

The HealthWatch is off this month

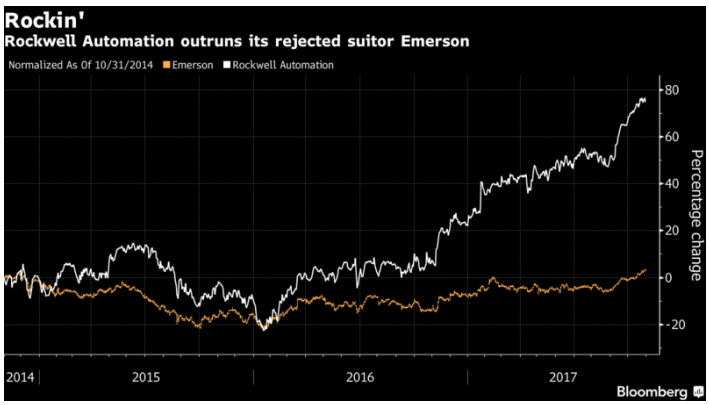
Desperately Seeking...Rockwell: Emerson's $29 Billion Bid for Rockwell Automation

During Emerson Exchange this year, it was clear that something was going on, although nobody was talking. Shortly afterward, we found out that Emerson Electric had made a $27 Billion offer for Rockwell Automation, and the Board of Rockwell had turned it down flat. It was clear that David Farr, CEO of Emerson Electric, was upset because he selected the afternoon of Rockwell's annual analyst and investor meeting, held conjointly with Automation Fair, to make another, higher offer— this time at $29 Billion. It is hard to see any other reason for the timing other than to attempt to provoke a shareholders' revolt at Rockwell, and initiate a hostile takeover. If that was Farr's intent, it was not successful.

Emerson CEO David Farr

Rockwell CEO Blake Moret

Rockwell CEO Blake Moret put it well in his letter to Farr, rejecting the latest offer. "Bigger is not always better for driving growth and value creation," Moret said. "While Emerson may see this proposed acquisition as necessary to enhance its growth and earnings potential and expand its capabilities in the industrial automation and information market, Rockwell does not."



Farr, on the other hand appeared rather petulant, when he said, "We are disappointed that the Rockwell board refused even to discuss the potential combination of our two great companies. Instead of engaging in constructive dialogue, the Rockwell board decided to let this unique and value-generative opportunity go unexplored."

Desperately Seeking...Rockwell (continued)

Moret, on the other hand, doesn't believe that the opportunity is all that great...for Rockwell.

Moret said in his letter Wednesday that when the two companies talked in June 2017, it was apparent that they were on "very different paths." Perhaps he meant the paths depicted in this chart from Bloomberg News.

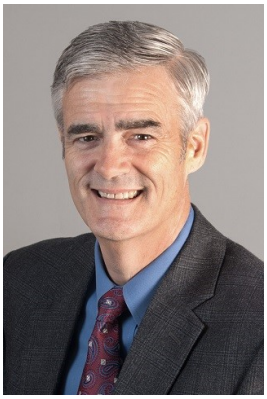
Moret claimed that a combined company would be highly leveraged, pointing to Moody's Investors Services estimate that the combination would result in a company with close to $25 billion in debt. "This weakened financial position would impair the proposed company's ability to make critical investments needed to support competitive differentiation and drive global growth," he said in his letter. He also said the synergies Emerson is projecting for the combined company would be difficult to achieve and would require cost cuts and a "substantial loss of talent."

For the past 30 years, Emerson has concentrated its automation business, with some small exceptions, on process automation, centered around its Fisher valve business, its Rosemount instrument business, and its DeltaV DCS and consulting businesses. Rockwell, on the other hand, concentrated on factory automation in discrete and hybrid automation systems in North America and Asia. Neither Rockwell nor Emerson has had much success in Europe or the Near East, due to the vigorous competition of Schneider Electric, ABB and Siemens, and in the Near East and Asia, Yokogawa and Honeywell. In Asia, both companies are being pressed by not only the European and Japanese companies but homegrown automation companies like Hollysys and Supcon.

But Rockwell has been tiptoeing into Emerson's pond. Its process automation business has been on a double-digit growth rate for the past five years, based on its Plant PAx DCS system, its Safety systems, and its Control Logix PLC systems for use in hybrid, batch, and discrete applications in the process industries. Rockwell PSUG, the process solutions user group, held its meeting in the two days immediately preceding Automation Fair, with over 800 users and integrators in attendance.

There is a significant difference too between Rockwell and Emerson in the way they deal with control system integrators and distributors. Rockwell has leveraged its relationship with its control system integrators to slip its process automation control systems into oil and gas, heavy chemical, water/wastewater, and biotech. Emerson does not willingly work with control system integrators, and its "distributors" or "local business partners" are captive sales and service houses.

In 2016, Emerson, under pressure from activist shareholders, reorganized what had been Emerson Process Management into Emerson Automation Solutions, under the leadership of Mike Train, a long time Emerson executive. Train's mandate was to create a process and factory automation company that could compete with ABB and Siemens on the world stage. Emerson considered several smaller automation companies— German *mittelstadt* companies, among others— and appears to have rejected them as too small or not quite a fit. ABB on the other hand, which took a well publicized run at Rockwell Automation several years ago, and again last year, decided that one of those smaller factory automation companies, B&R Automation, was just their cup of tea, and acquired it.



Emerson Automation Solutions Executive President Mike Train

Emerson's biggest problem is that they do not have institutional capability in the factory automation space. The executives at Emerson Automation Solutions are uniformly excellent— Emerson does a great job of creating and developing talent— but in process automation.

Rockwell's Paul Galeski

Meanwhile, Rockwell, in 2016, in one of new CEO Moret's first major moves, bought the largest independent control system integration company in process automation, Maverick Technologies. Thus, Rockwell became the owner of customer relationships with major oil companies and others, as well as a team of over 300 SME (subject matter enterprises) who Maverick's brilliant CEO Paul Galeski had assembled as they all retired from Exxon, Shell, Mobil, Chevron, and the like.

Desperately Seeking...Rockwell (continued)

The biggest problem Emerson faces is that they need a company like Rockwell far more than Rockwell needs them. In order to compete with Emerson's Rosemount instrument group, Rockwell made an extremely interesting very close relationship with Endress+Hauser, the Swiss family-held company which is slightly larger than the Rosemount group when compared apples to apples. This gave Rockwell a way to avoid being packaged out by Emerson in process automation projects, and gave Rockwell access to Endress+Hauser's distribution force, and Endress+Hauser access to Rockwell distributors and system integrators.

Emerson, of course, sees the huge synergy a combination of Emerson Automation Solutions and Rockwell Automation would provide. They have, the INSIDER has learned, even offered to make Rockwell the lead company, and keep Blake Moret as CEO.

So what will Emerson do now? The INSIDER believes the effort to acquire Rockwell is not yet over. The next step is to orchestrate a potential hostile takeover. If they can sweeten their offer, with less stock and more cash, they may catch the interest of Rockwell's institutional investors. Because, unless Emerson has the tenacity to start from basically the bottom in factory automation, and grow a business from near-scratch, like Rockwell did in its process business over the past 10 years, Emerson has very few places to turn, other than to do what ABB did, and buy a smaller automation company.

Emerson Exchange Casts Spotlight in Changes in Women's Contributions to Automation

by Joy Ward

Keynoter Robyn Benincasa

The recent Emerson Exchange did an excellent job of showing the range of how women and female insight can add to the automation industry. The two women who starred, Robyn Benincasa, the founder of WorldClass Teams as the keynote speaker and Janeen Judah, the President of the Society of Petroleum Engineers, the Women in Innovation speaker, gave listeners much to learn from and use in their careers.

Emerson started their recent meeting with one of the most exciting and challenging keynote speakers I have seen in a long time. Benincasa is a firefighter and adventure racer with nothing to do with automation, except that she had some of the best advice to members of the industry. Yes, we've all endured keynote speeches given by well-meaning but apparently automation-clueless speakers trying very hard to reach their audience. This speaker not only reached her audience but gave it marvelous advice and direction. Her message was one of cooperation, not competition. Too often we have been fed the message that life is about competition but not from this speaker. Through wonderful examples of her experiences adventure racing around the globe in some of the most challenging environments on earth, Benincasa showed how working together is a much stronger strategy than all-out competition. She also exhorted the crowd to work to win, not just NOT lose. This requires a different way of thinking and is a good lesson in today's accounting-driven world.

Luncheon Keynoter Janeen Judah

Then Emerson continued the good words from the women's side with a luncheon speech by Janeen Judah, the president of SPE, and a working petroleum engineer. While her message was not as physically exuberant, it was still both challenging and in the same vein — cooperation is the way for everyone to progress. She gave some sterling advice on how thinking of colleagues and doing well for them can come back to do well for everyone.

In summation, both women brought the same message to the Emerson crowd. Cooperation and what sociologist would consider traditionally female forms of interaction are healthier and ultimately more productive for individuals and companies. Is it possible that we are getting this type of message now because enough women are in the workplace and feel comfortable interacting and managing as women, not just women in steel boots? Whatever the reason, it is a healthy movement. Kudos for Emerson for hosting these two wise women and their messages!

Joy Ward has over thirty years' experience in consumer psychology research and is Director of Qualitative Research for Spitzer and Boyes LLC. Her MIND OF THE CUSTOMER® research methodology has been used in areas from politics to the automotive industry to satellite manufacturing. Contact Joy at joyward@sbcglobal.net or 314-283-5259 for information on how Joy can bring the Mind of the Customer® to your enterprise.

Emerson and Ranken Tech: Making More Automation Professionals

Emerson made it very clear at Emerson Exchange that the single biggest problem facing automation companies and their end user customers is skilled and trained workforce development. The highlight of the annual press conference was a talk by Stan Shoun, president of Ranken Technical College in St. Louis, MO, with which Emerson has entered into a partnership. It is such a close partnership, in fact, that Ed Monser, Emerson Electric's President and COO is a member of Ranken Tech's board of directors. When I visited Ranken the week after Exchange, Shoun proudly showed me the Corvette that his racing classes were customizing for Monser. Nice ride.

Stan Shoun

Emerson's Ed Monser

Since the college is in St. Louis, I went over to Ranken and visited Shoun after Emerson Exchange. In a tour that lasted several hours, he showed me all over the campus, which is a hidden jewel just north of Delmar in St. Louis. Delmar Boulevard is the dividing line between the extremely impoverished north city and the south city, south of Delmar. Ranken straddles the line and is extremely well placed to keep moving the line northward. In fact, since 1994, Ranken's Community Development Corporation has used trainee students' labor to build over 50 low income housing units as fill-in where older buildings have been destroyed.

Founded in 1907 by David Ranken, Jr., who donated his entire fortune as its endowment, Ranken Tech is a private, not-for-profit college that is dedicated to providing the training for the technical and mechanical occupations Ranken believed were the bedrock of America.

Ranken is both a two year and a four year institution, and also grants certificates in subjects such as HVAC, automobile mechanics, computer networking technology, and more. There are over 2300 students, some living on campus, and some participating in an innovative "8 weeks on campus, 8 weeks home" program. Many of the students are involved with sponsors in training programs, and there are over a dozen micro-enterprises run out of Ran ken using students as labor and sometimes even management, by Emerson and other businesses. The most recent micro-enterprise is the manufacture of deltaV training materials. They are being made by the students under the direction of people from Emerson.

Emerson, as well as other automation companies, such as Siemens, Schneider and Rockwell, have provided systems from simple to extremely complex for the students to train on.

The key to Ranken's success, Shoun believes, is that they fill a space between the trade schools and the four-year colleges that are dominated by liberal arts and the sciences. Ranken teaches technical subjects. They have liberal arts classes for their bachelor degrees, but they teach technical work, and technical work habits.

"I ask CEOs what keeps them up at night," Shoun told me. "Almost everyone tells me it's finding a skilled, stable technical workforce. But that's not right. Technology is not the limiting factor. Technology is actually outpacing our being able to work with it."

In Saint Louis, every day, there are 12,000 to 14,000 people out of work, and at the same time, there are 25,000 jobs going unfilled. Shoun says that this is the problem. This isn't a jobs issue, it is a skills issue, he said.

"The limiting factor is the workforce. Until we embrace this, the economy won't move forward. It will stagnate. We have to be able to build. This nation was built on a blue-collar-technical workforce. If we're going to continue to be a world leader, we'll need to develop the blue-collar, technical workers of the future."

And this is what Ranken Tech has been doing for more than 100 years. "Our founder gave us the mission of teaching the dignity of labor," said Shoun. "We make sure we prepare our students for careers. We have sixteen areas of technical edication that we focus on, and if it doesn't lead to a career, we don't mess with it."

Ranken is also unique in the emphasis they have on filling the student pipeline from an early age. Shoun said that they hold camps for students in middle school during the summer, to get them interested in technical subjects and careers. There is an innovative scholarship program called "L2E: Learn to Earn." The program was specifically developed to provide regional secondary students in sixth through twelfth grades increased exposure to STEM activities and the ability to earn college scholarship "credits" to assist students to pursue non-traditional careers in college. Students can amass up to $10,000 in "scholarship credit" to attend Ranken Technical College.

Ranken also has established what they call City Career College, which is devoted to training students for employment in advanced manufacturing and information technology. Shoun also points to the community outreach programs Ranken runs, such as a work release program, work in the juvenile detention center, to assist youth and other incarcerated persons to establish a new career.

Emerson and Ranken Tech: Making More Automation Professionals (continued), and Rockwell Does It With Manpower: the Academy of Advanced Manufacturing

Shoun is very clear on what Ranken needs to do, and how to get there. He notes that Ranken adds to the grading process something no other technical college does: work ethic. “"We teach technical education, general education and work ethic," said Shoun. "The number one thing asked for by industry today is to, 'Find me an employee that will show up on time, reliably and want to do the job.' Call it what you want, that is work ethic.” Some of our students have never had training in work ethic, and we give it to them, he said.

"They wear a uniform, get a haircut, and are graded on their communication, professionalism and teamwork," he told me. "If they don't receive a passing grade on the work ethic, they don't graduate. It's that simple.”

Rockwell Does It With Manpower: the Academy of Advanced Manufacturing

At the annual “Automation Perspectives” event, Rockwell and Manpower introduced the Academy of Advanced Manufacturing, a 12-week training course held at the Rockwell Mayfield Heights campus in Cleveland, Ohio. This course is aimed at assisting returning veterans to prepare for jobs in the automation industries. Several graduates of the first class were on hand to discuss the program and their feelings and prospects for employment. All of the graduates either had accepted a job in the automation field or were interviewing for jobs with a high probability of getting them. In fact, according to Joseph Allie, business manager for global competency, all of the graduates are guaranteed employment after graduation.

Rockwell’s Joe Allie interviews graduates of AAM at Automation Perspectives

Allie says that Rockwell is going to scale up the Academy, and offer courses in both Mayfield Heights and Milwaukee. “The goal,” he said, “ is to ramp up to 1000 graduates a year.” The curriculum was distilled from Rockwell’s existing three-month basic and three-month advanced training courses for field service and development engineers.

It is clear that the reason a 12-week program works is the antecedent training each of the graduates received as a member of the armed forces. Their existing training is focused and guided toward the needs of the automation end users in multiple industries. “Military veterans possess a unique combination of technical savvy and core work skills that makes them well-positioned for careers in today’s advanced manufacturing environments,” said Blake Moret, Rockwell’s CEO. With more than a million returning veterans, there is a consistent pool of potential employees, provided they have the right skills.


Rockwell’s Blake Moret

“We are seeing the emergence of a Skills Revolution today — where helping people upskill and adapt to this fast-changing world of work will be the defining challenge of our time,” said Jonas Prising, Chairman and CEO of ManpowerGroup. “This initiative is a great example of very intense workforce development. We’re using proven training programs and adapting them for talented veterans who bring valuable skills and experience to the workplace. In return, we’re equipping them for sustainable careers in a fast-growing industry and increasing their earning potential at the same time. It’s a winning formula.”

Manpower was represented at Automation Perspectives by group vice president Chris Layden, who said, "The manufacturing skills shortage is real and widespread. At the same time, rapid technology advances are creating new opportunities, but also the need for new skills that aren't readily available."

Rockwell also made a point of discussing its diversity and inclusivity programs. “The war for talent will get even more challenging,” said senior vice president Susan Schmidt at the Inclusion and Diversity Forum at Automation Fair. “Twenty-one percent or 2.5 million manufacturing workers will retire in the next eight years in the United States. 75% of employers say new skills will be required over the next two years. How do we find great talent and bring it into the organization? We must be thinking about how we recruit and retain talent. The challenge is not only how you hire great talent, but how you keep it.”


Rockwell VP HR Susan Schmidt

Rockwell Automation has been announced as a 2017 Catalyst Award winner and will be recognized on March 8 in New York City for the company’s Culture of Inclusion journey. The Catalyst Award honors innovative organizational approaches that address the recruitment, development and advancement of women and have led to proven, measurable results.

The INSIDER Visits the Wetzer Temperature Manufacturing Facility at Endress+Hauser Greenwood

The INSIDER was invited to tour the Wetzer facility that has recently opened on the Endress+Hauser Greenwood, Indiana, facility.

E+H's Pat McGlothlen

Guided by Patrick McGlothlen, general manager of Endress+Hauser Wetzer (USA) who is clearly a very proud papa, I received a cook's tour of a state of the art temperature manufacturing facility. The 42,000 square foot facility opened on May 31 of this year, and provides manufacturing services for North America, Mexico, Brazil, Argentina, Colombia, and Chile.

"This facility shows our absolute commitment to the North American and South American market," McGlothlen said. E+H invested over $8 million in the facility.

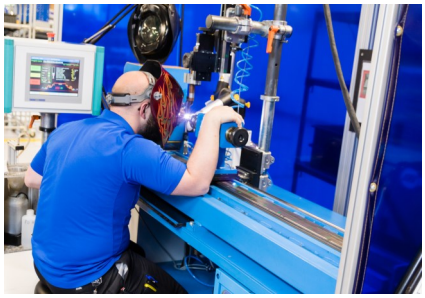
The new E+H Wetzer building in Greenwood

The Wetzer facility's 28 employees provide production for temperature measuring devices, recorders, system components, power supplies and calibration services. The new facility will develop and manufacture advanced sensor technologies, thermometer mechanics and fabrication, thermowell production, compact thermometers, temperature engineered solutions (TES), iTEMP transmitters, system components and recorders.

Temperature transmitter fabrication

According to McGlothlen, the facility is designed to use advanced manufacturing technologies in innovative ways to improve the quality and production throughput of Wetzer temperature products.

The plant uses advanced machining methodologies, lean manufacturing principles, and six sigma quality. All USA Endress+Hauser facilities are LEED certified with management systems for the environment, health, safety, and energy. The building is not only certified to meet LEED standards, but also ISO9001, ISO14001, and OHSAS18001.



Advanced manufacturing techniques in action

The Wetzer building is designed to be modular so that it can be expanded or modified to meet future needs for temperature product manufacturing. McGlothlen said "With the expansion of the temperature manufacturing facility, we will be more flexible in out product offering."

Just one building over is the first of several Process Training Units or PTUs in North America. These training units combine E+H field devices with Rockwell Automation control systems and are used to train E+H service professionals as well as customers. There are several of these units in North America, as well as in Europe and South America.

Endress+Hauser Process Training Unit in Greenwood, Indiana

The INSIDER Visits the Rosemount Shakopee Facility During Emerson Exchange

As part of the press at Emerson Exchange, we visited the new Shakopee, Minn., manufacturing facility for Emerson's Rosemount division. This facility is intended to both mirror and extend the manufacturing capabilities of Rosemount's Edcn Prairie, Minn., location. The new Shakopee location is the final assembly hub for Rosemount pressure, temperature, level, wireless and flame & gas products.

Rosemount Shakopee manufacturing

Inspection for 3051S Transmitter

Here, we see an Emerson employee inspecting a Rosemount 3051S pressure transmitter in Shakopee.

The Rosemount Wireless Pressure Gauge, similar to that pioneered by Cypress Envirosystems, is also manufactured in Shakopee.

In addition to the world-class manufacturing facilities at Shakopee, Emerson has also constructed a Customer Center which includes a sophisticated collaboration center. Customers can meet with Emerson experts both in person and by video conference to be able to handle their issues no matter where they are in the world. The Customer Center provides an environment where customers and Emerson experts can collaborate to solve problems, learn new techniques, and see new technologies used in the real world. They learn to manage remote operations using Emerson's deltaV, AMS and other tools, and this can accelerate their ability to optimize reliability and performance.

Wireless Pressure Gauge

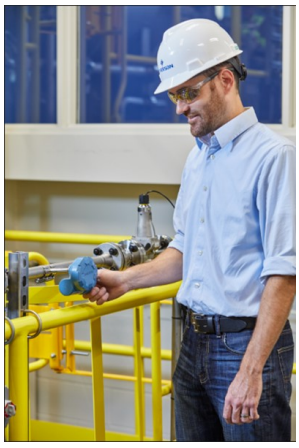
Shakopee Collaboration Center

But in addition to the collaboration center, Emerson has established an Interactive Plant Environment, which is designed to help customers simulate real-life process conditions through hands-on learning in a safe environment, and allows customers to interact with products and better understand best practices and troubleshooting techniques from the mentorship of certified Emerson instructors.

Shakopee Interactive Plant Environment

Like Rockwell, as discussed earlier, Emerson values diversity and inclusion. The management of the Shakopee facility is predominately women, and Emerson has significant numbers of women and people of color in rapidly advancing management roles.

The Shakopee facility, with both its manufacturing capabilities and its customer oriented collaboration and training centers, shows Emerson's dedication to the process industries, and the devices and best practices they can bring to their process customers.



Learning to calibrate a wireless steam trap monitor

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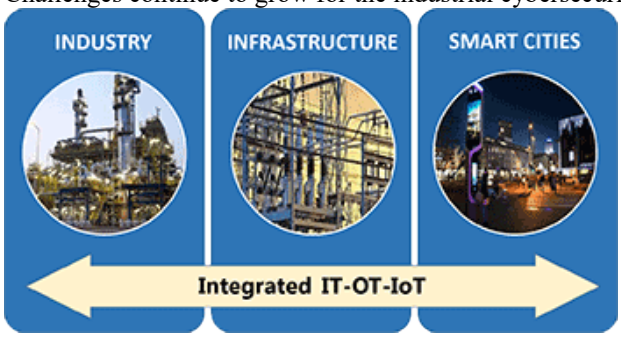
Presenting the 22nd Annual ARC Industry Forum: Digitizing and Securing Industry, Infrastructure, and Cities

February 12-15, 2018 - Orlando, Florida

It's happening fast. Everywhere we turn, things and processes are becoming more connected and intelligent. Streetlights, cars, gas turbines, and thermostats stream data. Buildings, refineries, oil platforms, mines, and wind turbines are optimizing asset and operating performance. Parking meters and distributed power grids deliver value to both consumers and operators. Design software can link to additive machines to print parts directly. And it's only the beginning.

Challenges continue to grow for the industrial cybersecurity community. Broader deployment of operational technology is expanding the use cases requiring protection. Resource shortages are undermining the effectiveness of established defenses. Blurring boundaries between IT, OT, and IoT are increasing the need for more integrated, collaborative cybersecurity strategies.



How will disruptive technologies change existing products, plants, and cities? Can cybersecurity threats be overcome? When will machine learning and artificial intelligence transform operations? Will open source solutions impact traditional software and automation domains? How will a digitally-enhanced workforce stem the loss of tribal knowledge? How do connected products create opportunities in aftermarket services? What steps can organizations take to foster innovative thinking?

There are countless ways to conduct your digital transformation journey, too many technologies and suppliers to evaluate, and endless choices to make along the way. Embedded systems, networks, software platforms, augmented reality, and machine learning may play a role as you begin to improve uptime, optimize operating performance, enhance service, and re-think business models.

Join us at the 22nd Annual ARC Industry Forum in Orlando, Florida to learn more about how digitizing factories, cities, and infrastructure will benefit technology end users and suppliers alike. Discover what your peers are doing today and what steps they are taking in their respective journeys.

For more information, or to register, visit:

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THE WAY I SEE IT

Editorial

Dick Morley, Manufacturing's Bad Boy, Dies October 17, 2017

Dick Morley loved his Harley. He rode until he was forced by ill health to give it up in his mid-70s. He told me that after he dropped out of MIT because he didn't want to learn German, he went down to Brooklyn and got a job as a bouncer in a biker bar. He had a rare genetic mutation that made him not feel pain. So he could go after big bikers fearlessly. He said he met his wife, Shirley, there. "She was a real biker chick," he said. Together, he and Shirley raised their own and over 35 foster children. When she passed, it was clear to his friends that Dick had lost the will to live.

But what a life he led. You'd think that the man who invented the floppy disk, the handheld terminal, zone building HVAC, was the father of the PLC, and created the people mover for Detroit and Disney World, among the more than 100 patents he held, would be a household name, but Dick was a surprisingly private individual who didn't really want or enjoy credit for all that, and the limelight. So names like Bill Gates and Steve Jobs became famous, while Dick Morley just went on inventing.

Comments? Talk to me!
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http://www.spitzerandboyes.com

He invented sex-linked (his and hers) chocolate. He was working in his last years with several Chinese firms who were trying to use stem cells to cure cancer. He said they were very close, too.

Dick and Shirley, and Odo Struger (of Allen-Bradley) and his wife were skiing buddies. I'm sure that the ideas that led to the Modicon PLC were discussed on the chairlift and in the lodge in the evening. But Dick hated long lift lines. He went to his boss and said, I want to work Wednesday through Sunday, please. His boss said, "No, and why aren't you wearing a necktie?" Dick, as you might guess, quit on the spot.

Shirley told him they had about six months' savings, so he'd better invent something good, quickly. Bedford Associates was born and started doing work in programming for CNC machines. One night, Dick said, he got drunk and the concept of the PLC came to him as if in a dream.

"It was always a computer," Dick told me, "but we had to call it something else so that the plant floor electricians would be allowed to operate it. So we called it a PLC, and we programmed it in ladder logic, which most of the electricians knew."

Ladder logic is the most widely used industrial programming language to this day, and his other brainchild, Modbus, may be the oldest network protocol in common use. They were simple, elegant, easy to use, easy to learn to use, and very powerful...all hallmarks of the Morley touch.

If Dick thought you were worthy of it, he'd talk to you for hours. I loved spending time with him in his later years, listening to his stories, and his no-nonsense theories about manufacturing. For example, he believed that the proper ratio of engineers to sales people was about 10 sales people to every engineer. Very different beliefs than most entrepreneurs.

He and his friend Jim Pinto spent years as angel investors, specializing in helping young inventors be successful. And he always made sure that there were a couple of young entrepreneurs at the annual Geek Pride Day at his barn in New Hampshire.

Some of Dick's friends are planning a memorial Geek Pride Day next June in his memory. If you are interested in being part of the planning, let me know.

Dick was a good friend, a brilliant and unconventional mind, and a very great man. I will, we all will, miss him very much.

Farewell to MIT's most famous drop-out. May your Harley ever run sweet, Dick.

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Rajabahadur V. Arcot: The Battle for IT/OT Dominance

The future holds the promise of the dawn of a new industrial era and the convergence of Operational Technology and Information Technology will hugely impact manufacturing companies.

In order to differentiate the existing from the emerging systems & solutions and to highlight the importance of OT and IT convergence, new acronyms are getting coined.

...many of the manufacturing companies are looking forward to benefit for OT / IT convergence and are highly optimistic that it will make them truly real-time information driven organizations...

What we call as automation systems, DCS, PLC, SCADA and such others and enterprise solutions which include ERP, SCM, CRM, EAM and similar others are labeled respectively as Operational Technology (OT) & Information Technology (IT). According to numerous survey reports that appear periodically, many of the manufacturing companies are looking forward to benefit for OT / IT convergence and are highly optimistic that it will make them truly real-time information driven organizations and secure their future in the emerging industrial era- Industry 4.0.

Production and business operations of manufacturing companies have always been driven by information both from the shop-floor and top-floor. Initially, they deployed instruments to generate shop-floor information and top-floor transactional information was mostly generated offline.

Manufacturing companies' ability to create value to their shareholders, while ensuring customer satisfaction in the emerging era of manufacturing, depends on their ability to tightly couple the operations of all their value chain partners comprising of numerous part / sub-assembly / raw material suppliers, design associates, service providers and such others.

It will become extremely important for them to ensure that, on one hand, all their production and business decisions are based on holistic and integrated real-time information and, on the other that they work collaboratively.

The fact that manufacturing operations have become more complex and competitive pressures have increased and the realization that their success depends entirely on becoming truly information driven, make industrial firms demand not only real-time data from the production and business operations, suppliers, customers, and such others, but also want them integrated and analyzed so as to derive holistic information.

The recent rapid technological developments such as those relating to internet of things, artificial intelligence, machine learning, big data analytics, cloud computing, and Internet Protocol version 6 (IPv6), and OT and IT convergence, make it possible for multiple sources of data to be connected and large amount of data from them to be collected and analyzed holistically on a common platform.

Until now, manufacturing companies invested in OT to manage production floor operations while ensuring plant's safe, efficient, and automated functioning and IT comprising of Enterprise Resource Planning (ERP), Supply Chain Management (SCM), Customer Relationship Management (CRM), Supplier Relationship Management (SRM), Product Design Management (PDM), Manufacturing Execution Systems (MES), and such others to assist enterprise level decision making.

Often automation systems and enterprise solutions are procured from best-of-the-class suppliers and their integration required significant investments in terms of costs and time.

Information collection & their display and control of important production operations

Rajabahadur V. Arcot: The Battle for IT/OT Dominance (continued…)

became integral part of manufacturing companies many decades ago.

Suppliers of automation systems, such as Honeywell, Yokogawa, and Rockwell, realizing the power of computer and communication technologies, as they evolved, in data collection, transmission, and processing capabilities responded to the needs of the manufacturing industries and introduced of programmable logic controllers, distributed control systems, safety instrumented systems, electronic transmitters, and similar others that extensively rely on computer and communication technologies.

Later they developed communication protocols that further enhanced the role of automation systems. Some of the leading suppliers of enterprise solutions are SAP, Oracle, and IBM and they also leveraged the power of computer and communication technologies

Automation systems and enterprise solutions evolved separately at different points of time and respectively addressed the informational needs of plant floor and top floor.

The business models of the suppliers of automation systems and enterprise solutions differ significantly and their offerings are designed and engineered to meet different functional and operational needs.

Even the way automation systems and enterprise solutions are specified, budgeted, and procured differ fundamentally. While, in the case of OT their safe operation and availability are most important, in the case of IT data confidentiality is more important than system availability.

A new breed of companies, such as Apple, Microsoft, Alphabet, IBM, and Cisco Systems, which in recent years have emerged as the leading technology firms of the world, have strong competencies in technologies associated with Internet of Things, artificial intelligence, machine learning, big data analytics, and cloud computing.

Seeing tremendous growth and monetization opportunities, leading technology firms are making large investments and establishing new centers of excellence to develop and demonstrate their competencies. They are emerging as strong challengers to the traditional OT and IT suppliers and often are seen taking initiatives to emerge as dominant players the in OT / IT domain. They have already started offering OT/IT platforms / infrastructure such as Azure (Microsoft), Watson (IBM), Alexa (Amazon), DeepMind (Alphabet), and such others.

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Who will succeed and emerge as leading suppliers, what will the architecture of their offerings and the open standards they will follow are questions that await answers.

May be, mega mergers and acquisitions are the way-out and probably are in the making; or we may have to watch for the success of collaboration agreements, such as the one between ABB and IBM.

Yet another way out may be for the push to come from the end users. One such example is the ExxonMobil Research and Engineering Company's forward looking initiative. It has entered into an agreement with Lockheed Martin to serve as a system integrator in the early stage development of new architecture for the next -generation open and secure automation systems for process industries. They intend sharing the details of the new architecture resulting from their efforts with OT players.

Interesting developments and mind games are on and it is difficult to predict how it will play out and who will emerge winners.

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