Media Opportunities: Call for Pitches

written by admin | January 28, 2016

DCED is proud to relaunch our proactive media pitching initiative by sharing a brand-new editorial calendar for top site selection publications read by site consultants and business leaders across the country.

Our team will write and send the pitch to our media contacts for consideration. While we can't guarantee that all pitches will be picked up, we can make sure to share the good ideas you have to offer.

What we look for in a pitch idea:

- A recent, compellinig, Pennsylvania-centric story about a community, a company, or industry in your region
- A point of contact willing to speak about their story

And that's it!

We're collecting pitches on the following topics:

Have a pitch idea?

If you have an idea for a media pitch, please contact Jenna Lefever by email or 717-231-5334 with your ideas.

Worried about forgetting? Don't be! DCED will send reminders in March, May, and June, too. If you don't have a story idea right now, DCED will take them any time inspiration strikes.

2016 Shale Gas Innovation Contest

written by admin | January 28, 2016

Put Down Your Shovels and Enter the 5th Annual 2016 Shale Gas Innovation Contest – Applications due by Midnight, Feb 1st!

STATE COLLEGE, PA – The snowstorm is over! Now it's time for innovators in Pennsylvania and West Virginia to complete their applications to enter the **5th Annual Shale Gas Innovation Contest!** If you are developing or recently commercialized a new product or service that has applicability to any aspect of the O&G industry, and you're located in one of these two states you should be entering

the contest. The contest, sponsored by the Ben Franklin Shale Gas Innovation and Commercialization Center (www.sgicc.org) offers a total of **$80,000 in cash prizes**.

Any new technology that could be employed along the entire O&G industry value chain is of interest, including ancillary technologies like novel coatings or chemicals, sensors, IT management concepts, and EH&S focused concepts. A simple online application can be found at http://www.sgicc.org/2016-shale-gas-innovation-contest.html.

Appalachian Drilling Services accepts Winner's Check at 2015 Finals Event. Pictured are Bill Hall, SGICC Director, Seth Martin, President & CEO, and Trent Muthler, VP Sales of ADS, and Jennifer Leinbach, PA DCED Office of Tech & Innovation

Applicants chosen as Finalists will gain exposure to investors, potential partners, and industry sponsors at the **May 18th, 2016 Finals Event** which will be held at the Hilton Garden Inn in Southpointe, PA. Mark your calendars now and plan to attend this **FREE EVENT** which will also include a poster session highlighting promising technologies under development at regional universities and research centers.

Finalists will be chosen by a panel of industry experts. The contest is open to small businesses, researchers, or entrepreneurs in Pennsylvania or West Virginia. To review the eligibility requirements and download an application, visit www.sgicc.org and click on the **2016 Shale Gas Innovation Contest** tab. **Deadline to enter is 11:59PM on February 1st, 2016.** For questions regarding eligibility or for any other questions, contact Bill Hall at either 814-933-8203 or billhall@psu.edu.

The Pay Premium for Manufacturing Workers as Measured by Federal Statistics

written by admin | January 28, 2016

Historically, manufacturing jobs have offered relatively high pay, but there is not a consensus on the size of the pay premium for manufacturing jobs relative to the economy as a whole or even whether a premium continues to exist.

This report calculates and compares the average pay of manufacturing workers and the average pay of workers overall using 10 federal datasets, each of which allows us to calculate and compare the average pay of manufacturing workers and the average pay of workers overall.

Read more…

The State of Manufacturing Technology in 2016… and Beyond

written by admin | January 28, 2016

New technologies are changing the economies of scale so that large- and small-scale value chains can be successful.

(IW – Kimberly Knickle: 1-8-16) As an industry, manufacturing is "hot." Regions are creating manufacturing initiatives, countries are creating policies to lure manufacturing back and prepare the next generation of talent, maker fairs show entrepreneurs and small-scale artisans how they too can design and manufacture their own products, what manufacturers sell goes well beyond the 100-year-old recipe and the mechanical drawings, and new technologies are changing the economies of scale so that large- and small-scale value chains can be successful.

Worldwide manufacturers will spend an estimated $323 billion on external IT expenditures, according to IDC's Pivot Table: Worldwide Manufacturing IT Spending Guide, Version 2, 2013–2018. All of this change means that IT is increasingly an integral part of manufacturing's success and we're on our way to a digital transformation.

Our predictions span topics that are relevant across the entire company, in the plant operations, engineering and R&D, supply chain planning and execution, and service delivery. Key themes relate to customer engagement and customer service, supply chain modernization to support evolving market requirements and manufacturers' "need for speed," the fundamental nature of innovation in processes, products and services, and the fact is it isn't enough just to have technology—companies must work to create value from their investments and have the right talent. And most importantly, the rapid adoption of new technologies and innovation accelerators is changing business models.

I'd like to set the stage with some background, essentially a few of the drivers or expectations behind manufacturers' business priorities, IT initiatives and the predictions we share below. Our first driver is digital business transformation (DX) (see graphic at the top of the page) and the fact that manufacturers are applying and must apply third-platform technologies and innovation accelerators to enable DX. In our graphic, you can see the core technologies that includes, from Big Data and analytics to next generation security. For manufacturers, DX is changing the way manufacturers design, make and deliver products and services, as well as how they define those products and services.

Our second key driver is cyber-IQ, combining technologies such as the Internet of

Things (IoT) and cognitive with massive datasets and advanced analytics and improving the way people and machines interact. In the manufacturing industry, this impacts everyday work and processes in our organizations as well as connections to suppliers and customers.

A couple of our drivers relate to manufacturers' dynamic business environment, including the way geographic regions increase competition, add customer complexity and operating challenges. Regional variations above and beyond cost will continue to factor into many manufacturing decisions—for example, which markets are emerging, where the best talent is located, and which factors are most relevant when selecting a new location for a plant.

Similarly, change in the value chain is also a factor in our predictions. Regardless of how vertically integrated manufacturers are, they've always recognized the success of their products in the market is based on their ability to cooperate and collaborate as a network. In some manufacturing industry segments, OEMs are increasingly relying on Tier 1 or even Tier 2 suppliers for innovation or cost savings, with mixed results.

Similarly, manufacturers across all industry segments are putting more information and influence in the hands of their customers. This elevates the requirement for collaboration, communication and coordination in a secure, organized and resilient manner.

Two of our drivers are about key assets—information assets and the workforce. IDC estimates the digital universe is growing at 40% per year, and will reach 44ZB, or 44 trillion gigabytes by 2020. The challenge is to exploit information as an asset that can fuel digital transformation—to create new efficiencies or generate new revenue streams. Information must be usable for analysis and in turn analyzed; this will provide manufacturers with visibility into the actual product performance and create a foundation for continuous improvement and new products and services.

In the workforce, manufacturers have long-time, experienced workers close to retirement and a new generation of tech-savvy workers; knowledge is leaving the organization, and new ways of working are entering the organization. There are an increasing number of manufacturers without the talent and workers they need in

their factories, supply chains, engineering, and research and development. As a result, manufacturers are embedding tech into everyday work life, to help their employees do their jobs—manage their operations, design products and develop new intellectual property from anywhere in the world and more easily access critical work-related information from anywhere.

And our final driver is about business-relevant security, spanning cyber and physical security across IT and OT (operations technology). In addition to securing data centers, networks, transactional systems, customer data and engineering designs, the convergence of IT and OT and the addition of sensor data on connected assets, products and supply chains are changing the security roadmap. An integrated approach to security will also account for sensors, supervisory control and data acquisition (SCADA), GIS, GPS, data historians. Really a mix of IT and OT, or a mix of what's traditionally on the network and what's just getting onto the network.

Top 10 Manufacturing Predictions for 2016

With that introduction, let me share our predictions for 2016:

1. The Impact of Customer Centricity: By the end of 2017, those manufacturers that have leveraged customer-centricity investments will gain market share growth in the range of 2-3 percentage points.
2. Global Standards for Global Manufacturers: In 2016, 90% of manufacturers will impose their global standards on all operations, including outsourced operations and suppliers, to decrease risk and increase market opportunities.
3. Value Realization: By the end of 2016, 65% of manufacturers will have metrics in place to evaluate and drive pervasive changes in the workplace with their new technology investments.
4. Building on IoT-enabled Products and Processes. By 2019, 75% of manufacturing value chains will undergo an operating model transformation with digitally connected processes that improve responsiveness and productivity by 15%.
5: Redefining Modern Supply Chain Logistics. By 2019, 50% of manufacturers will have modernized their logistics network to leverage 3-D printing, robotics and cognitive computing to support innovative postponement strategies.
6: The Decline of Short-Term Forecasting. By the end of 2019, enterprise-wide

improvements in resiliency and visibility will render short-term forecasting moot for 50% of all consumer products manufacturers and 25% of all others.
7: Enterprise Quality via the Product Innovation Platform. By 2018, 60% of top 100 global manufacturers will be using a product innovation platform approach to drive enterprise quality throughout the product and service lifecycles.
8: The Digital Twin. By 2017, 40% of large manufacturers will use virtual simulation to model their products, manufacturing processes, and service delivery to optimize product and service innovation.
9: Smart Manufacturing with Cloud, Mobile, and Big Data and Analytics. By the end of 2017, 50% of manufacturers will exploit the synergy of cloud, mobility, and advanced analytics to facilitate innovative, integrated ways of working on the shop floor.
10: IT Transformation for Digitally Executed Manufacturing. In 2016, 20% of manufacturers will begin to break down organizational silos, reshape IT portfolios, and import new IT talent in the plant for digitally executed manufacturing.

New technologies and enhancements are necessary to achieve the digital transformation required for the next generation of manufacturing. Manufacturers must review their current application portfolio; modernize processes in the back office and the plant, and in all aspects of the value chain upstream and downstream; and upgrade their decision-making capabilities.

Consider the following to ensure you maximize the value from current and future technology investments:

• Help your IT talent learn new technologies and better understand the needs of their business customers.
• Ensure that IT and line of business are collaborating as true partners in the selection and implementation of new technology.
• Consider how your investments in IT and operational technologies can lead to business transformation, not just incremental improvements.
• Look to your employees and customers for innovative ideas for the use of new technology and best practices in terms of implementation and use.
• Work with partners to accelerate your IT capabilities and serve the line of business. As you embed more technology in how you operate, external resources and

expertise can help you move quickly and effectively.

2016 promises to be an exciting year for those manufacturers that can move forward on their digital transformation journey.
(Kimberly Knickle is research vice president of IDC Manufacturing Insights.)

Outsourcing Manufacturing: A 20/20 view

written by admin | January 28, 2016
(Supply Chain Management Review — Peerless Research Group: 1-11-16) Outsourcing Manufacturing is becoming a well-established approach for companies that want to strategically manage materials in today's fast-paced business environment.

While feedback from respondents was varied, it's clear that outsourcing is here to stay. Even with the current trends of reshoring and bringing manufacturing in-house, outsourcing remains a key strategy for most firms. While they may tactically "reshuffle" or rebalance in-house vs. outsourced manufacturing, there does not appear to be a wholesale move away from reliance on outsourcing.

Supply Chain Visibility as an Equalizer

Outsourcing is by no means a large company phenomenon. Technology advances have leveled the playing field, bringing benefits to small, midmarket, and large companies alike. The major drivers of outsourced manufacturing
for smaller firms include access to expertise, while midmarket companies typically benefit from increased margins.

For companies of all sizes, and across all industries, outsourced manufacturing works best when brand owners/original equipment manufacturers (OEM) have broad

visibility into and the ability to share forecasts, orders, and inventory across partners in the entire supply chain. With this visibility, companies can ensure continuity of supply, jointly resolve disruptions when problems occur, and gain access to expanded revenue opportunities.

Improved visibility also enables better risk management of inventory liability and a host of opportunities for
process improvement and cost reduction. In return, manufacturers see various benefits from outsourcing to reliable manufacturing and logistics partners, including cost and asset reductions, access to skilled labor, third-party design, and manufacturing expertise, along with the ability to quickly scale production up or down.

An outsourcing strategy also allows brand owners to focus on their core competencies of design, brand management,
and sales, while relying on partners to manage manufacturing and distribution.

But has the promise of outsourcing truly been fulfilled over the past two decades?

To find out, Peerless Research Group (PRG), on behalf of Supply Chain Management Review and E2open, conducted a survey of 94 top supply chain executives in companies with $250 million or more in annual revenues.

The survey was commissioned to assess the current state and future plans for outsourcing manufacturing.

Researchers sought to better understand:

• how companies outsource their tasks;
• what the outsourcing forecasts look like for the next couple of years;
• what level of visibility there is over the end-to-end process; and
• how technology is being used to manage the process.

In assessing today’s typical manufacturing environment, business-to-business (B2B) information sharing remains largely manual point-to- point communication of important information such as forecast and inventory positions. This
serial communication approach often leads to poor visibility for shipments and

material stock and in turn prevents manufacturers from realizing the full benefits of their outsourced strategy.

By leveraging outsourced manufacturing and complementing it with visibility platforms, companies can increase the productivity of their partners' external operations by more effectively negotiating, working, and collaborating with their business partners. With partner visibility and collaboration working in unison, additional benefits include faster time-to-market of new products with higher quality.

Key Findings:

Outsourcing Manufacturing Tasks

The majority (84 percent) of organizations surveyed outsource their manufacturing production to some extent. Among those companies that do outsource, one in four subcontracts out more than half of their manufacturing processes.

The main benefits gained from outsourcing their production tasks include decreased manufacturing costs and associated costs of goods sold, and the ability to leverage core competencies from companies who have more knowledge and experience with manufacturing and logistics processes.

Main Reasons for Outsourcing Manufacturing

- Reduce manufacturing/COGS costs
- Rely on third parties for manufacturing expertise/core competency
- Rapid growth/expansion
- Increase responsiveness/agility
- Asset reduction (asset-lite strategy)
- Product design expertise
- Regional/local expansion

Due to these ongoing benefits, very few companies plan to decrease their outsourcing activities over the next two years, according to the survey. In fact, one in three firms predicts an increase in the level of outsourced manufacturing services that they use, while almost half (46 percent) plan to continue their current

outsourced manufacturing strategy.

Companies that outsource manufacturing have realized valuable improvements from their decision to offload activities to reliable partners. For nearly half (44 percent) of respondents, operating margins have grown and nearly a third (32 percent) are seeing earlier new product introductions. One continuing challenge is increased lead times:
improved collaboration could help companies manage to this constraint.

Forecast for Outsourcing Levels During the Next Two Years

• Increase outsourcing – 33%
• Decrease outsourcing – 22%
• No change – 46%
figure 3
Unfortunately, visibility appears to be inadequate for many companies. While companies see the greatest level of visibility with their tier 1 contract manufacturers, visibility with these partners still lags for many: just over half (52 percent) of the firms say visibility with these top tier trading partners is either on medium or low levels. Visibility with partners in other tiers is even lower: 66 percent of organizations surveyed assess visibility with their tier 2, tier
3, and tier 4 suppliers to be, at best, medium or low.

Outsourcing Strategies

The survey found that companies are most likely to use outsourced manufacturing either with newly developed products or those with long production cycles. Products that have shorter production cycles, or are more highly
tailored, tend to be handled in-house.
figure 5
Circumstances When Manufacturing is Outsourced

• Longer lifecycle products
• New products
• Short life cycle
13%

Other outsourced supply chain planning, fulfillment operations and product design, for example, are largely managed internally, while third-party partners are more apt to have “ownership” of manufacturing tasks and kitting. There is still a great dependency on partners for information, which is why collaboration is vital to the success of outsourcing manufacturing.

Collaborative Planning

The responsibility for managing raw materials, components, and finished goods is divided between the original equipment manufacturer (OEM) and the contract manufacturer (CM). Either the OEM obtains components directly
from the supplier and sends them to the third party manufacturer or it has the supplier send parts directly to the CM.

How Components are Managed and Supplied

• Contract manufacturer orders from supplier – 54%
• Brand owner/OEM sends components to CM – 47%
• Brand owner/OEM orders from supplier and supplier sends directly to CM – 46%
figure 7
In most instances (60 percent) the brand owner/OEM has clear visibility into the CM’s component inventory, according to the survey. Yet, as previously cited, visibility is lacking for about one in four (23 percent) of companies,
while 17 percent of organizations report they are “unsure” of the brand owner/OEM’s visibility.

As for supply chain visibility, access to data regarding in-stock position, purchase orders, and in-transit inventory are among the top processes for which suppliers have visibility. A potentially large benefit to the brand owner exists for supplier visibility to upside availability, effectively what could be sold, given the availability of product. Brand owners have an opportunity to drive increased revenue directly through supplier collaboration and visibility to
this category of demand.

OEMs (49 percent) and Tier 2, Tier 3 and Tier 4 suppliers (42 percent) share fairly equally in the ownership of parts inventory. This proves that there is a sense of

“sharing” or collaboration across the supply chain, where both brand owners and suppliers take equal responsibility for purchasing and maintaining stock levels necessary for servicing end users. Unfortunately, there remains a lack of visibility across these various pockets of inventory.

Interestingly—yet perhaps not surprisingly— the majority of businesses still share forecast data with their suppliers using conventional methods, such as spreadsheets sent via e-mail (54 percent). Only slightly more than one in
three organizations employ an integrated B2B systems approach, while a small percentage (6 percent) of companies surveyed report that they don’t share forecast information at all with suppliers.
e 8
Purchasing and Inventory

In looking at changes that have taken place due to outsourced manufacturing, inventory throughout supply chain networks remains mostly higher for outsourced products. Slightly more than one in three companies (39 percent) say inventory is higher, more than one in four (27 percent) believe it’s lower for products outsourced, and about one-third (34 percent) have seen no change in inventory levels.
• e 12
Summary and Conclusions

The outsourcing trend is expected to continue into 2016 and beyond. Whether a manufacturer is looking to scale up quickly (and is unable to do so using internal resources), expand globally, or focus on core competencies, outsourcing can provide these capabilities.

The promise of outsourced manufacturing: saving money; reducing manual, error-filled communication; and improving visibility and control in the supply chain is showing results.

But there exists a real opportunity to unlock even greater efficiencies and effectiveness with:

• extended visibility across multiple tiers of suppliers;

• still untapped upside responsiveness between brand owner and suppliers; and
• mutually beneficial approaches to reducing overall inventory liability.

Only slightly more than one in three organizations employ an integrated B2B systems approach, while a small percentage (6 percent) of companies surveyed report that they don't share forecast information at all with suppliers.
e 13
Applicable for companies of all sizes, outsourcing works most efficiently when brand owners/OEMs have complete end-to-end visibility of their supply chains—something many have not yet achieved. To meet this goal, moving supply chain networks onto an integrated, collaborative platform can empower brand owners and their partners to see, share, and act on the best possible information in real-time—a single source of truth—when plan deviations can
still be turned into cost savings or revenue opportunities. This degree of collaborative planning and execution enables brand owners, suppliers, distributors, and customers to leverage the collective brainpower of their trading partner communities to manage end-to-end supply chain processes and to respond intelligently to continuous change in supply, demand, products, and partners.

What's the Strategy Driving your Innovation

written by admin | January 28, 2016
Six key questions to ask to create a clear market-driven new product strategy for your company's innovation efforts.

(IW – Mike Dalton: 1-11-16) It's almost axiomatic – business growth requires a clear vision or goal and strategies to support it. However, a lack of clear direction continues to be one of the most common complaints I hear from the development groups of industrial business to business companies. Of course a lack of direction

also means wasted innovation resources, so let me share a story about a company dealing with that issue.

I was meeting with a group of top managers from a mid-size lighting company struggling with new product programs that were severely delayed. They were being constantly interrupted with smaller opportunities and just couldn't seem to make progress on what the team felt were the really big opportunities and threats they were facing in the market. As a result, growth had stagnated and an increasing percentage of their sales were becoming commodity driven.

Of course, that prompted me to ask about their strategy. If these new areas had been identified as important elements for success, what was the strategic level plan to address the gaps? One of the managers replied "What strategy—we don't have one!" Another replied, "No that's not fair, there's a strategic plan and it's managed by the CFO." That's when I knew what a big part of their problem was.

Nothing against CFOs in general, but in this case what they were calling a strategic plan was actually just a top-down, multi-year budgeting exercise. It didn't really address key market facing initiatives and cascade them down to the focus areas and activities within each part of the company—not all that uncommon in mid-size and smaller firms.

When I asked how they knew what areas they should be focusing on, the VP of R&D looked across the table at me and just shook his head, "We know what the important drivers are in the market and try to run projects against them, but sometimes I feel like our strategy is to just work on projects for whichever customer is the biggest or screams the loudest. For once, I'd like to be sharing new products that we've already developed in anticipation of their needs."

The company was at a point where they needed to make a transition from customer driven to market driven, but without a clear delineation of their new product strategy and its importance to their growth, they were struggling with the transition.

So here are some of the key questions the company needed to answer in order to create a clear market driven new product strategy around each potential market driver or unmet need:

• What's changing in your customers' world making it harder for them to do business?
• What kinds of challenges are those changes creating for your customers in terms of new sales throughput, working capital and operating expenditures (Delta T, I, and OE for those familiar with Theory of Constraints)?
• What solutions (products, services, or a combination) could you potentially offer to help them address the change?
• What value would your solution create for your customer and for downstream users as compared to competitive alternatives?
• How would you share in that value through either value-based pricing strategies or through new business models?
• Would that share of the value be a good return on your development investment?

If a cross-functional team can answer these questions to provide a compelling argument for investment, then it's time to put dedicated resources against a plan to build that new market segment. From there, execution still requires competent project and resource management, but recovering this hidden innovation capacity all starts with a clear strategic focus on unmet market needs.

Manufacturing Trends to Watch in 2016

written by admin | January 28, 2016
(Manufacturing Leadership: 1-5-16) As the New Year begins, the editorial team at the Manufacturing Leadership Council offers 12 business and technology predictions for the year ahead. Included are predictions about global manufacturing growth, the adoption of Manufacturing 4.0 concepts and technologies, manufacturing skills sets, cybersecurity, smart products, and how the subject of manufacturing might fare in the U.S. presidential election campaign.
Global Manufacturing to Grow Modestly: Economists and governmental

organizations are predicting respectable industrial growth in 2016, assuming that there are no disruptive political or economic events. A 2.6% growth rate is foreseen in the U.S. China and India, although currently in contraction, are seen as faring better, with 6% growth predicted in China and as much as 8% growth foreseen for India. With its economy continuing to recover, European manufacturing growth, while uneven country by country, is expected to grow faster than the U.S. The yet-unknowns: the migrant crisis in Europe, the global threat of ISIS terrorism, and the possibility of more sophisticated cyberattacks, any of which could upset business conditions and damage growth.

U.S. Election Year Blues: Despite a rise in state-sponsored manufacturing competition from countries such as China and India, U.S. manufacturing will struggle for visibility during the U.S. Presidential election year as terrorism, immigration, and rising income inequality, among other topics, dominate the national political debate. None of the major candidates from either political party have demonstrated knowledge of or a focus on manufacturing. The one bright spot: the selection of the U.S. as the partner country at the world's largest industrial event, the Hannover Fair, in April in Germany. And the participation of President Obama, the first time a sitting U.S. president will be in attendance at the Fair.

Manufacturing 4.0 In Action: 2016 will be the year when the much-vaunted theories behind Manufacturing / Industry 4.0 that have been developed over the last few years move into real-life practice as front-line use cases begin to bring to life the opportunities for applying advanced new digital, cyber-physical approaches to plant floor automation and processes to significantly improve manufacturing productivity, flexibility, quality and efficiency. Companies that can serve as role models for others will emerge. And end-user demands for interconnectivity and software standards will intensify.

Small Manufacturers to Fight the 'Digital Divide': Concerned that they could fall rapidly behind global competitors with greater financial and other resources, small- and medium-size manufacturing companies will move more aggressively to develop strategies to embrace Manufacturing 4.0 concepts and technologies. For many, this will include modernizing plant floor equipment and moving to state-of-the-art operational systems, including cloud-based ERP systems, to better manage information.

The Rise of the Chief Digital Officer: Many manufacturers will begin to realize that current siloed organizational roles are inadequate for the new digital era of manufacturing and will appoint specific executives with the cross-functional power to drive digital transformation across the enterprise. Chief Digital Officers will not only be silo-breaking evangelists of the new digital age, but will actively lead initiatives to help create end-to-end 'Digital Threads' that stretch from the supply chain, to production sites, to the development and deployment of smarter products.

IoT Drives New Smart Business Models: Internet of Things (IoT) technologies will be everywhere this year — from the tools you use, to the products you make, to the devices you wear. This digital pervasiveness will drive the creation of new, smart business models for manufacturers built around embedded connectivity, big data, advanced analytics, and new data-driven services. Such services will not only be single-company or product based, but will also begin to emerge as disruptive, collaborative, shared industry platforms in areas such as healthcare and transportation.

'Smart Products' Value More Clearly Identified: Manufacturers will push not just to design and connect more smart products, but increasingly they will seek to secure and monetize those smart platforms. Having connected the majority of their new models, auto manufacturers, for example, will dig deeper to understand the unique value that they can deliver through these smart platforms as they seek to differentiate themselves from device providers such as Google and Apple who are planning to enter the automotive space.

New Technologies Will Push Boundaries: A host of advanced technologies – collaborative robots, 3D printing, simulation, augmented reality, cloud-based software systems, to name a few – will gain a greater share of mind among manufacturers as many embark on the journey to Manufacturing 4.0. The year 2016 will be one of intense information gathering and education as manufacturers seek to understand how they can apply these technologies to their own operations, what the business case can be, how to identify and select suppliers, and how these technologies will re-shape their organizations, skills inventories, and work patterns.

Robots Get Collaborative: Among the advanced technologies manufacturers will increasingly embrace, the flurry of announcements last year around more affordable robots that can work safely alongside human employees in collaborative ways will begin to transform many plant floor working environments in the year ahead.

Heuristic capabilities based on visual analysis and machine learning will make these collaborative robots easier to program for intricate tasks, more flexible in the variety of jobs they can perform, and easier to deploy in front-line manufacturing roles. Labor issues may hinder deployment in some cases, but the overall adoption trend will be unstoppable. At the same time, more affordable general-purpose robots will be increasingly adopted by small- and medium-size manufacturers.

3D Printing to Gain Ground: Also among the advanced technologies is 3D printing, which will continue to challenge traditional production models. Consumers will adopt personalized 3D printing for self-printed clothing, parts, and household items, while businesses will acquire them to aid in the production of their products and product parts. Further innovations, including quality improvements, to enable 3D printers to use metals and other materials more effectively will drive demand for the machines in the aerospace, medical, and automotive sectors.

Cybersecurity Becomes More Formalized: Manufacturers of all sizes will increasingly be expected to demonstrate that they have put in place the state-of-the-art technologies and internal processes needed to protect their plants, intellectual property, supply chains, and customers from cybersecurity vulnerabilities. Much of the push for security audits and documentation will come from industrial customers. But regulators such as the SEC will also get in on the act, requiring that manufacturers prove that they have mitigated the kinds of security threats that could have profound financial impacts.

Skill Sets Will Be Rethought: As digitization increasingly demands a much more integrated, agile, and responsive organization, manufacturers will rethink the backgrounds and skill sets required of contributors up and down the corporate structure. On the plant floor, manufacturers will seek out and encourage workers with strong communication and collaboration skills and who are comfortable with new technologies. Meanwhile, in leadership ranks, manufacturers will value those who can cultivate engagement and exert their positive influence across functional boundaries.

Better Demand Planning Emerges: As demand continues to fluctuate unpredictably—particularly in markets such as Europe and China—manufacturers will create more agile, demand-driven planning processes, replacing traditional but increasingly inaccurate push-based forecasting models that are based on historical patterns. This will require manufacturers to accelerate the digitization of existing

processes, break down internal functional silos, and vastly improve collaboration and communication with supply and demand chain partners.
(David Brousell is Global Vice President, General Manager and Editorial Director of the Manufacturing Leadership Council. Contributors to this blog include Jeff Moad, Sankara Narayanan, and Paul Tate.)

The Logistics of Efficient and Effective Purchasing

written by admin | January 28, 2016
While the integration of your external supply chain is critical, companies should first make sure that their internal supply chain is truly integrated and collaborative to reach the full benefits of a lean supply chain.

Read on…

Ben Franklin SGICC's 2016 Shale Gas Innovation Contest

written by admin | January 28, 2016
Apply Now for Ben Franklin SGICC's 2016 Shale Gas Innovation Contest!

Just a reminder to all Innovators that applications can be submitted between now and 11:59PM on February 1st for the Ben Franklin Shale Gas Innovation and Commercialization Center's **5th Annual Shale Gas Innovation Contest**. A simple

online application can be found at http://www.sgicc.org/2016-shale-gas-innovation-contest.html.

A total of $80,000 in cash prizes for the four best new product ideas, or service concepts that are either in the development stage or recently launched by researchers, entrepreneurs, or small businesses in Pennsylvania or West Virginia can apply. Ideas that have applicability to any aspect of the O&G industry or their suppliers, or that focus on natural gas or NGL utilization or conversion, or that address EH&S aspects related to the industry are all of interest.

In addition to the cash prizes, successful applicants will gain exposure to investors, potential partners, and industry sponsors at this year's Finals Event **already scheduled to take place on May 18th, 2016 at the Hilton Garden Inn in Southpointe, PA**. In addition there will be a poster session included to highlight some of the most promising technologies under development from our regional university sponsors and partners.

This 5th Annual Shale Gas Innovation Contest's **GOLD Sponsor** is the Ben Franklin Technology Partners (http://www.benfranklin.org). **Industry sponsors** include: AquaTech (www.aquatech.com), Chevron Technology Ventures (http://www.chevron.com/ctv/ctvi/), EQT Corporation (https://www.eqt.com/), First National Bank (www.fnb-online.com), GE Oil & Gas (http://www.ge-energy.com), Inflection Energy (http://www.inflectionenergy.com/), LPR Energy (http://www.lprenergy.com/), LPR Land Services (http://www.lprls.com/), the Marcellus Shale Coalition (http://marcelluscoalition.org), PPG Industries (http://corporate.ppg.com/), Praxair (www.praxair.com), Steptoe & Johnson PLLC (http://www.steptoe-johnson.com/), and Williams (www.williamsinthenortheast.com). **Non-Profit sponsors** include: Carnegie Mellon University's Scott Institute for Energy Innovation (http://www.cmu.edu/energy/), Penn State University's Institute for Natural Gas Research (http://www.ems.psu.edu/INGaR) the University of Pittsburgh's Center for Energy (http://www.engineering.pitt.edu/cfe/), and West Virginia University's Energy Institute (http://energy.wvu.edu/).

Finalists will be chosen by a panel of industry experts. To download an application,

visit www.sgicc.org and click on the **2016 Shale Gas Innovation Contest** tab.

Deadline to enter is 11:59PM on February 1st, 2016. For details regarding eligibility or other questions, contact Bill Hall at either 814-933-8203 or billhall@psu.edu.

About the SGICC

The Ben Franklin Shale Gas Innovation and Commercialization Center (www.sgicc.org) is designed to harness innovation and new technologies as a means to maximize the economic return to Pennsylvania's citizens from the Marcellus and Utica shale formations. The Center's goal is to increase sustainable employment and wealth creation in Pennsylvania that has the potential to outlast the initial exploration, production and transportation of natural gas from the formations. The Center will also identify, support and commercialize technologies and early-stage businesses that enhance responsible stewardship of the environment while properly utilizing this transformative energy asset.

IT and OT Converging in the Factory of the Future

written by admin | January 28, 2016

Technology, innovation, and advanced manufacturing capabilities are the agents of change that you need to understand, and embrace

(American Machinist – Larry Korak: 12-23-15) The "Factory of the Future" is being built on technology, innovation, and advanced manufacturing capabilities. But what is it, exactly? And what are the technologies you need to know about to help your manufacturing company embrace the change?

The definition of the Factory of the Future is evolving; even the name is in flux. Some call it Smart Manufacturing, Industry 4.0, or the Digital Enterprise. While the terms vary, there's one thing that is clear: The Factory of the Future is the product of fast-changing disruptive technologies hitting manufacturing like a cyclone.

Information technology and *operational technology* are both seeing drastic innovations, and the convergence of these two forces is creating a paradigm shift. Manufacturing is experiencing the fourth industrial revolution. Many analysts predict that the stagnation and slow recovery that followed the Great Recession will evolve into a period of expansion for manufacturers. Although margins will likely remain compressed, tools for greater savings and improved capabilities will make it easier for manufacturers to achieve profits and growth. The impact of these technologies and the Factory of the Future is growing.

IndustryWeek reports that 40% of manufacturers believe that smart manufacturing and its foundational technology—the Internet of Things—are within reach and it's the right time to invest.

Huffington Post reports that early adopters of modern solutions that have at least partially implemented smart manufacturing initiatives have documented measurable results:

• 82% reported increased efficiency
• 49% reported lower product defects
• 45% reported customer satisfaction gains

The impact promises to grow and be even more substantial as manufacturers and their suppliers deploy technologies across the entire manufacturing landscape, from product design to supply chain logistics. *Greater speed, value, innovation, and closer alignment with demanding customers will be the new normal.*

Five IT Forces Driving Modernization

IT solutions are at the foundation of the Factory of the Future. New IT technologies, from cloud computing to the Internet of Things, are changing the way manufacturers do business—from the shop floor to the back office and throughout the entire value

chain.

Manufacturers should consider harnessing more than one of these IT capabilities in order to fully benefit from the next generation technologies transforming manufacturing.

Value chain visibility — In order to achieve greater visibility across their value chain, manufacturers must eliminate silos and get disparate systems to communicate. After all, data is meaningless if it is stored in silos and if it lacks the full dimension of context and consequence. They need to ensure that real-time access is available to easily monitor the details of the complete manufacturing operation—within the four walls and beyond. Interoperability is the key word here; it's a step beyond simple integration. Data must be able to be *consumed in context* and used for event triggers and actions. A highly flexible ERP system is the starting point for accomplishing this goal.

Mobile and social connectivity — Manufacturing leaders can't be tethered to their offices, desks, and PCs. They walk the plant floor. They make decisions on site, in the heart of the operation. They need 24/7 access to critical data and systems from remote locations. This can range from a maintenance technician who's checking the inventory of a spare part while repairing a critical piece of equipment, to a warehouse manager using a tablet to confirm the location of forklifts and personnel. We live on a planet with over 7.2 billion active SIM cards—that's more mobile devices than there are human beings.

On the social front, manufacturers need to take advantage of integrated tools to capture conversations and use those to build a knowledge base and document key decisions relating to product design and customer orders. In a recent survey, 61% of CEOs said socially-enabled business processes are important to business. McKinsey Global Institute estimates suggest that by fully implementing social technologies, companies have an opportunity to raise the productivity of interaction workers—high-skill knowledge workers, including managers and professionals—by 20 to 25%.

Cloud-enabled agility — More than ever before, manufacturers are being forced to keep pace with fast-changing global trends. New markets, new customer demands,

omni-channel shopping, and growing competition from start-ups are driving manufacturers to become more agile. Accelerated product launches, more product offerings, highly configured products, and additional value-add services are among the ways manufacturers strive to remain relevant and maintain or gain market share.

Cloud solutions, because they offer faster deployment and implementation, support manufacturers in these efforts. Cloud solutions allow manufacturers to easily add branches, bring on new fabricating facilities, and set up new distribution hubs without needing to invest in hardware and servers. Implementations take weeks, rather than months; and new sites can be online and producing with remarkable ease.

Analysts are reporting increased adoption of cloud solutions. A report by IDC says, "According to IDC's 2015 Vertical IT and Communications Survey of 602 United States–based manufacturers, cloud services are at the top of manufacturers' IT initiatives, and just over 43% of manufacturers are using public cloud and 56% are using private cloud in pilot, proof of concept, or in production. We see similar adoption rates worldwide. In fact, a majority of manufacturers worldwide are currently using public (66%) or private (68%) cloud for more than two applications, according to the respondents that qualified for IDC's 2014 CloudView Survey."

Data ingenuity — As gears, grease, and steam ran the manufacturing plants of the last century, today data is the force that makes modern manufacturing cost-effective. Insights derived from data analysis help manufacturers focus on markets, buying trends, customer attributes, cost of raw materials, time, labor, and operational costs, as well as details about the product in use in the market and consumer opinions. *As the Internet of Things moves past today's infancy stage, the role of Big Data will only increase*. The challenge, therefore, lies not in collecting as much data as possible, but in setting a data strategy. Manufacturers need a clear roadmap for how to turn their data into meaningful actions. Data paralysis is a real threat that must be avoided.

Customer centricity — The fifth element of the Factory of the Future is perhaps the most critical. Today's market economy has evolved into a customer-centered model

that stresses speed of delivery, product value and a positive customer experience. Consumers—in nearly every industry—are highly vocal, fickle, and quick to turn elsewhere if they are disappointed. Manufacturers are not exempt from dealing with easily outraged customers who are willing to share their complaints about a product or service with hundreds of thousands of "close friends" on social media. Modern customer relationship management (CRM) solutions, collaborative tools, online portals, and product configuration abilities all help to provide customers with a positive experience. Warranty management and after-market service abilities also help to enhance value after the point of sale.

Operating Technologies for the Future

Operational technology is also a vital part of the Factory of the Future blueprint. Shop floor production, fabrication, assembly, automation, material handling, logistics, scheduling, and labor tracking are all operational elements that are receiving careful scrutiny from manufacturers looking to improve their efficiency.

Faced with extremely thin margins and volatile supply chain costs, manufacturers are increasingly turning to operational processes for improvements in efficiency and productivity. In many cases, manufacturers have already cut the typical excesses out of their budgets. Their workforce is lean. They've eliminated non-essential projects and perks. And they have little control over market prices and competing vendors. *This leaves operational tactics as the best way to control shop floor costs and improve profitability.*

Here are five *operational technologies* that are helping to propel manufacturing:

Robotics — Robotics are becoming more and more import to manufacturers that are looking to control costs and improve accuracy in highly dangerous or difficult conditions. The last several years have seen a sharp resurgence in orders of industrial robots, roughly tripling in the wake of the Great Recession. The global robotic systems market (including software peripherals and other related costs) is estimated to reach $41 billion by 2020, according to Allied Market Research.

According to *Time*, online retail powerhouse Amazon recently demonstrated its faith in using robotics for warehousing operations when it purchased Kiva Systems for

$775 million and announced plans to roll out 10,000 robots into a network of warehouses, a move which it says will realize fulfillment cost-savings of up to $900 million— or up to 40% savings on cost per order.

Product innovation and product configuration tools — To meet customer demand for highly personalized products, manufacturers are turning to product configuration tools. These tools help manufacturers manage the complexity of design variations, product quotes and production specifications. Integration with online portals and CAD solutions allow customers to visualize designs, adding to the positive customer experience—while also improving accuracy and speeding the quote-to-cash cycle.

Production innovation has been greatly enhanced by 3D printing. Additive manufacturing has made prototyping and design of new products much easier, quicker, and more economical. Manufacturers are gradually finding applications for additive manufacturing that go beyond experimentation—and that instead are relevant, practical, and profitable. According to a recent Innovations Survey, two-thirds of manufacturers are already adopting 3D printing. The study also estimates that the global 3D printer market will reach $6 billion by 2017 (up from $2.2 billion in 2012).

Closed-loop quality control — Manufacturers are using automated quality control methods to help control consistency and brand value. Consumers have little tolerance for unexpected variations. Manufacturers are learning they can deploy sensors and monitoring devices at numerous checkpoints in the production cycle—rather than only at final stage inspection to help detect noncompliance issues early and minimize waste.

Late stage assembly — As customers are increasingly demanding engineer–to-order (ETO) and made-to-order (MTO) products, manufacturers are turning to delayed assembly or late-stage assembly to help them manage this mass consumerization trend. By designing products in interchangeable modules, components can be manufactured and inventoried while the manufacturer waits for an order. When the order is received—either at the retail outlet, online portal, or through a channel partner—the product is assembled with the appropriate details and accessories, and drop shipped to the customer.

A similar concept is distributed manufacturing where the raw materials and methods of fabrication are decentralized, and the final product is manufactured very close to the final customer. Distributed manufacturing is a growing trend, like reshoring, where manufacturers, their suppliers, and subcontractors work to form the right combination of proximity to customer and a productive location. Cloud deployment supports this agility and "pop up" manufacturing movement by letting manufacturers deploy systems in a matter of weeks, not months or years.

IoT-aided logistics supply chain management — The Internet of Things (IoT) will undoubtedly impact many aspects of manufacturing. Supply chain management and logistics seem to hold some of the greatest potential. Already scanners, bar codes, and GPS tracking are being used to monitor the movement of goods in the warehouse and on trucks to customers. A recent survey indicated that:

• 35% of manufacturers currently collect and use data generated by smart devices to enhance manufacturing/operating processes, and an additional 17% plan to do so in the next three years;
• 38% currently embed sensors in products that enable end-users/customers to collect sensor-generated data, with an additional 31% planning to do so in the future;
• 34% believe it is "extremely critical" for U.S. manufacturers to adopt an IOT strategy.

This is an exciting time for manufacturers. Economic recovery and global growth point to optimism on the horizon. The Factory of the Future is right around the corner. The most important take-away is that manufacturers need to start now in order to remain competitive in the new manufacturing paradigm. A wait-and-see attitude is highly risky, putting companies in danger of losing market share to an existing competitor or a start-up with a low-cost alternative product.

Manufacturers' ERP system is the foundation upon which they can build the Factory of the Future. They need an ERP system that has a flexible architecture so the solution can expand along with their company, and they can easily integrate specialized applications such as CRM solutions or product configuration tools to meet their changing needs.

Manufacturers also need to consider their deployment options for the disruptive technologies that will help shape the Factory of the Future. Cloud deployment is the great enabler for solutions like Big Data and the Internet of Things. Cloud deployment offers the agility and storage needed to fully incorporate the vast amount of sensor data, customer account data, product history, and expense data needed to be proactive and in-tune with customer expectations.

(Larry Korak is the Director of Industry Strategy Direction, Industrial Manufacturing at Infor, a developer of enterprise software ranging from financial systems and resource planning to supply chain and customer relationships.)