Fluency Business Debates

TOPIC NUMBER 64

SMEs in the Fourth Revolution

SMEs (Small to Medium Size Enterprises) in the Fourth Revolution

As we have seen, customers today have dramatically higher expectations, but traditional service providers. So, if the smart factory is the centerpiece of Industry 4.0 and the defining characteristic of a smart factory is its interconnections with other factories, the logical question to ask is whether the benefits of the Fourth Revolution will be reserved only for large enterprises with multiple facilities.

What about SMEs?

There are two answers to this question.

First, it's worth noting that even single-facility enterprises can potentially benefit from the sort of information sharing described above. Consider a simple case: A shipment from an SME's cutting tool supplier will be delayed due to severe weather conditions. That information is relayed to the SME's Manufacturing Execution System (MES), which directs its machining centers to reduce their speed and feed rates to decrease the chances of too many tools breaking before the shipment arrives. The point is, even if you only have one factory, you can still benefit from having that factory digitally connected to the rest of your supply chain.

The second, and more important answer to the question of whether SMEs will be able to reap the rewards of Industry 4.0 points to a trickle-down—and sometimes trickle-up—effect of production technology. Take additive manufacturing, for example. Some of the early success stories for 3D printing were the ones about low-cost, custom applications. If you're trying to make a million of the same thing, you're not using 3D printing. But, if you're a lab making dental appliances and they're all different, you can print the whole run. That's looking at it from one direction, but with costs coming down and part quality going up, 3D printing is starting to find its way into those larger-volume applications.

We've seen this trend before in previous industrial revolutions. Industrial robots and CNCs used to be found only in the largest and most sophisticated facilities, but now they're a common sight in factories and job shops across the sector. The reason is obvious: return on investment, ROI.

If the big companies get spoken about more frequently, it's probably because there's bigger numbers associated with their savings and outcome opportunities. But for smaller locations, the same percentage benefit is possible and, in fact, some of the technologies that would have been very expensive to deploy at a small customer's location can now be deployed using cloud technology and on a subscription basis that is very closely linked to the outcomes they are going to generate. So, a small site might be able to take advantage of technology that previously was only really affordable by a larger customer.

So, the answer to question whether SMEs will benefit from Industry 4.0 seems to be, "Yes," though with the qualification that they may take some time, if previous revolutions are any indication. On the other hand, the pace of change in industrial revolutions does seem to be accelerating: Industry 1.0 arose over a period of 80 years and Industry 2.0 in a little more than half that time. The pace of change with automation and CNC in Industry 3.0 should be recent enough to be obvious. Regardless, one thing is certain: the pace of Industry 4.0 will be set by SMEs.

New Developments in Manufacturing

Nothing defines an industrial revolution better than the technology involved, so it's worth considering what to expect from the machinery and software of Industry 4.0. Given the sheer scope of technological change entailed by an industrial revolution, covering every new development in a single article is impossible. Instead, let's focus on two areas in particular: additive manufacturing and the IIoT (Industrial Internet of Things, or IIoT - the use of internet of things technologies to enhance manufacturing and industrial processes).

Additive Manufacturing in Industry 4.0

As a technology, 3D printing has seen incredible advancement over the past decade, steadily progressing from prototyping to production and other applications. Metal additive manufacturing is particularly promising as a production technology, and its efficiency is only improving.

If you go back to the earlier days of 3D printing, you had a handful of companies with a business model that was essentially, "Here's the machine, here's the software and here are the materials", and the materials were generally closed, i.e., proprietary. Obviously, that's a beautiful business model for those companies, but now, with the next wave of 3D printing companies, our strategy is to be more open with the materials you can use. That has opened the floodgates for the major plastics companies of the world to get into this market. As a result, the pace of development in new materials and the pace of innovation has greatly increased.

Once again, the fourth industrial revolution proves to be more about optimization than innovation. In the case of additive manufacturing, it's a matter of improving production and post-production processes—like heat treatments—and materials, or more accurately, material selection.

The Industrial Internet of Things (IIoT) in Industry 4.0

The IIoT is a complicated topic, one that warrants a feature of its own. Connectivity plays a major role in the fourth industrial revolution, both within and across its smart factories. We provide process licenses for large pieces of equipment at refineries and petrochemical plants that, in essence, run their processes for converting petroleum into other chemicals.

The challenge is always that the technology is optimized when it is delivered but needs to be operated in a particular way to maintain that level of optimization over a period of time. It can be challenging for customers who don't all have the skills to ensure that those pieces of equipment are constantly optimized. By connecting that equipment up to Honeywell's cloud environment, for example, companies are able to monitor its performance against its nameplate capacity and identify instances where it's starting to degrade. More than that, we are now able to very clearly understand the reason why it's happening and provide an advisory service to the customer to make a change.

This sort of predictive maintenance enabled via the cloud is exactly the sort of optimization that comes with the fourth industrial revolution. By taking production data beyond the four walls of plant, manufacturers will be able to eliminate unplanned downtime across their facilities and gather insights for improving efficiencies beyond what's been previously possible.

The Skills Gap and Industry 4.0

Despite all the optimism that comes with the future of manufacturing, there are good reasons to be concerned, too. Chief among them is the so-called skills gap. According to analysis from Deloitte, there will be 3.5 million job openings in manufacturing over the next decade but only enough skilled labor to fill less than half of them.

With 2 million jobs potentially unfilled, there have been many proposals for upskilling the workforce in short order. Efforts to attract more millennials to take up careers in manufacturing—for example, by using social media — have met with some success, but what if the real solution to the skills gap is a technological one?

We're not going to see robots replacing humans across all of these different industrial processes. There's a dozen different reports from different institutes and organizations predicting that as artificial intelligence and the utilization of collaborative robots grows, it will actually increase the workforce, rather than decrease it. Of course, that will require a different skillset than what we have today.

Emphasizing the role new technologies can play in helping to develop that skillset

The tools we have to educate and empower people today are unparalleled: being able to provide a field worker with a digital set of procedures that walks them through the steps they need to perform, being able to use augmented reality to see how equipment is performing as you're standing in front of it, using virtual reality to train on a procedure even 10 minutes before you perform it. The tools available really are unprecedented and they're helping us address that competency gap.

To return to the analogy with consumer goods, consider how overwhelming it can be for someone to switch from a dumb phone to a smart one. The traditional physical keypad is gone, the simple interface replaced by scores of indecipherable icons for apps. How are we supposed to figure out how to use this thing if we can't even call someone for help? The answer, of course, is in the phone itself: once you figure out how to google user manuals or pull up YouTube tutorials, you're off and running. So too with the fourth industrial revolution: the tools for handling it are part of the revolution itself.

The Fourth Revolution

When does the revolution begin? Unfortunately, if you're hoping for something like a date to plug into your calendar, you're going to be sorely disappointed. It helps to remember that the dates for previous industrial revolutions are merely approximations—it's not as though on Jan. 1, 1760, there was some official declaration that the industrial revolution had begun. Revolutions on this scale are never so simple.

Rather than worrying about when Industry 4.0 begins, consider asking yourself a different question:

If the Fourth Revolution begins tomorrow, will I be ready?

QUESTIONS

1. It is said that as artificial intelligence and the utilization of robots grow, a completely different skillset of workers will prevent a reduction in the labor force. What´s your view on this?

2. Do you consider that with the tools we have today is enough to start training future employees for the Fourth Revolution? Do you think that being able to search for information on the web today is part of this training? How come?

3. Write down a question for debate regarding this topic.