EVENT SUMMARY

Powering industry 4.0: seizing the digital opportunity

March 17th 2022

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Executive Summary

Advanced technologies are allowing businesses to reinvent themselves while also presenting new challenges to be overcome. To explore this theme, Economist Impact convened “Powering Industry 4.0: Seizing the Digital Opportunity,” a panel discussion sponsored by Kyndryl. Ana Nicholls, director of industry analysis at the Economist Intelligence Unit, moderated a panel of experts consisting of Rajeev Puri, chief technology officer for United States manufacturing, communications and energy at Kyndryl; Patrick Thompson, chief information and digital transformation officer at Albemarle Corporation; and Lutz Beck, chief information officer at Daimler Trucks North America.
A sense of urgency

Digitalization has been on the agenda of most industrial companies for a while now, but the interruption of supply chains during the covid-19 crisis has raised the urgency of digital transformation programs.

Applying advanced technologies to manufacturing—such as the internet of things (IoT), digital twins, machine learning and cloud computing—can open up new business models and revenue streams, reducing costs, delivering efficiency and productivity gains and, perhaps most critically, improving resilience to unplanned events.

But adopting Industry 4.0 themes is a complex and costly process. According to the panelists, it needs to begin with a change in corporate culture.

“For me, digital transformation and Industry 4.0 is not just about technology, it is about a shift in mindset,” said Mr. Beck. “It is about looking across the whole value chain in a different way and then bringing in technologies.” Since many organizations have a limited budget for digital transformation, he recommended that rather than trying to achieve everything at once, companies should look at what is really needed and set priorities. “What is not adding value to our customer experience, we put on the back-burner,” he commented.
Self-funding investments

Mr. Thompson of Albemarle, however, observed that technology investments are usually self-funding. Industrial plants typically do not run at their full nameplate capacity, so even a small improvement in productivity driven by digitalization can be worth hundreds of millions of dollars in additional revenue. Once the return on investment is understood, boardroom conversations about digital transformation become much easier.

Integrating information technology (IT) and operational technology (OT) is at the core of Industry 4.0. Sensors applied to OT and connected to the IoT can create opportunities to optimize manufacturing processes, with artificial intelligence delivering data and insights that drive real-time decision-making, predicting and preventing equipment failures and improving quality. Mr. Puri of Kyndryl noted that one difficulty companies often have with digital transformation is understanding where the domain of control of IT and OT, which have traditionally been separate, will sit in future. He said the simple answer in manufacturing is “to start with safety and end with safety,” so that both these technological domains should be run by those within the organization that are best places to manage risks and ensure security.

Mr. Thompson highlighted legacy IT systems and the need for interoperability as being the biggest challenges his company has dealt with in its digital transformation journey. Albemarle has 16 manufacturing plants around the world that have been acquired over time, and they use many different technologies and standards. “We are dealing with a lot of different technologies and trying to move to a common ground and get operational standards across the board and bring in a platform that everyone can use from an analytics perspective, with all those divergent sources of data,” he said. “It makes it very challenging, especially when you are mapping out your framework on your data elements.”
Off-the-shelf solutions

Albemarle has moved away from custom-built packages and now looks for “best of breed” solutions that deliver speed and efficiency, Mr. Thompson revealed. “We had 4,000 custom objects in SAP. We went to S/4HANA and we don’t have one line of code change,” he said. “We used it all out of the box.”

He added that the company considers S/4HANA as a foundation on which to add other digital technologies that create exponential value, listing Power BI, OSI, SampleManager LIMS, and Northwest Analytics among the software packages it currently uses. “If you try to customize your way there, you will be five to ten years away from getting to some of those rich features,” he commented. “Digital technologies can get you there in an accelerated way.”

To avoid similar legacy problems in the future, Daimler is also moving away from custom-built applications and increasingly using software as a service, said Mr. Beck. The company now has a rule that 80% of its software solutions have to be standard, off-the-shelf products. “It is easier from an operational level, specifically [for] G&A (general and administrative) functions, HR, and finance. We have a home-grown warranty system and now we are looking for an off-the-shelf software product to replace it,” he said.

Mr. Beck also revealed that his company has introduced supply-chain monitoring in the wake of the pandemic, which involves bringing together different platforms and technologies. “We worked with a big player on the technology side for supply-chain insights, where we go down to the component suppliers to understand basically how it can impact our production,” he explained. The technology, based on machine learning, is already running with two suppliers and the plan is to roll it out more widely and to reach down to the individual component level to garner insights on capacity and tooling constraints, so Daimler can plan its production and sequencing more efficiently.
Heightened security risk

Cyber-security is an integral part of Industry 4.0, as linking IT and OT and integrating supply chains creates additional security risks for firms. Mr. Puri said it was essential that cyber-security is embedded into digitalization with robust controls on data interchange. He also noted that spending on cyber-security had increased more than fivefold since the Russian invasion of Ukraine and security was now “top of mind” for businesses.

Mr. Thompson revealed that before covid-19, Albemarle had received 4 billion cyber-security threats per month, but now it is up to 25 billion. He said the company uses NIS cyber-security protection, with bidirectional data controls to protect OT platforms. He also disclosed that Albemarle has exported 100 terabytes of data to the cloud. “It is all about resiliency—cyber risk and supply chain risk,” Thompson said. “If something did get hacked, we have a copy of it. Supply-chain relationships, dependency on materials for our plants and transportation—those things are also addressed as part of our resiliency plan.” The aim of that plan is “to not be vulnerable to a single point of failure.” The plan even extends to training data scientists internally rather than competing for them in the labor market.
Data integrity

Panelists identified data ethics as an increasingly important topic for companies to address. Digitalization generates huge volumes of data. While not all of it is important and meaningful, the value of digitalization lies in the insights drawn from data and how data can be monetized. Companies need to be mindful of regulations surrounding how data is used and shared, especially as they dig for insights further down the supply chain. Mr. Puri warned about the bias built into machine learning and said self-learning capabilities still needed to be better understood. Mr. Beck echoed these concerns, saying companies need to be asking themselves, “Is it our data? Can we use it? And what is the quality of the data?”

As companies look to reposition themselves in the digital era, many elements need to come together, including the right technology and security protections, the right people and partners and, above all, an organization-wide appetite to do things differently. The companies that manage to fulfill these requirements will thrive.