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## ASIA MAGAZINE

**CAN ROBOTS HELP TO SAVE THE AILING F&B INDUSTRY?**

**HOW DO SMES BENEFIT FROM INTERNET OF THINGS?**

**THE INTERNET OF SPACE: NONTERRESTRIAL NETWORK PATH EMERGES FOR SATELLITE IOT**

**COVER STORY:  
SCHNEIDER ELECTRIC:  
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## Publisher's Message

As we close out 2020 and look ahead to 2021, we have seen the growth of IR4.0 in the Southeast Asia. Some countries are progressing to adopt the AI applications and are looking ahead at developing Industry 4.0 economies. Vietnam is scaling up its industrial and digital capabilities as they are looking forward to developing smart cities completed with smart energy. On the other hand, Indonesia had come up with several programs such as the Bekraf Digital Talent and Go Startup Indonesia as a way to assist its digital economy.

For the country's economic route, Malaysia has started the process of integrating digital technologies to all areas of economies. The National 4IR (Industry 4.0) and Digital Economy Council and the National Digital Infrastructure Plan (Jendela) is said to speed up the growth of our digital economy. Malaysia Digital Economy Corporation (MDEC) is planning to establish Malaysia as 'The Heart of Digital Asean' and is looking forward to ramping up in fully utilizing the tools for Industry 4.0. With Industry 4.0 technology, it will help various sectors of business and companies also enhancing a better living for society, especially for the rural areas.

We have Aspen Technology, Inc. and Schneider Electric Malaysia for our interview sections where readers will have insights toward the Industrial Artificial Intelligence in Malaysia and how IoT drives the economy and various industry toward the digital transformation.

Stay tuned to our upcoming live interview session, Unlocking IoT Full Potential in the New Normal on the 8th of Dec 2020! On behalf of the editorial team, I thank you for your massive support to Automate Asia Magazine. Stay in touch with us on [www.asiaautomate.com](http://www.asiaautomate.com) for more updates.



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### DISTRIBUTED BY

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### PRINTED BY

MMS PRINT SHOP (M) SDN. BHD. (1246387-v)

NO 43G, Jalan PBS 14/2, Taman Perindustrian Bukit Serdang, 43300 Seri Kembangan, Selangor.

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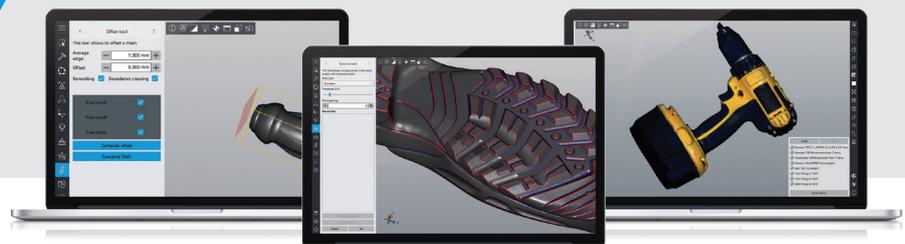


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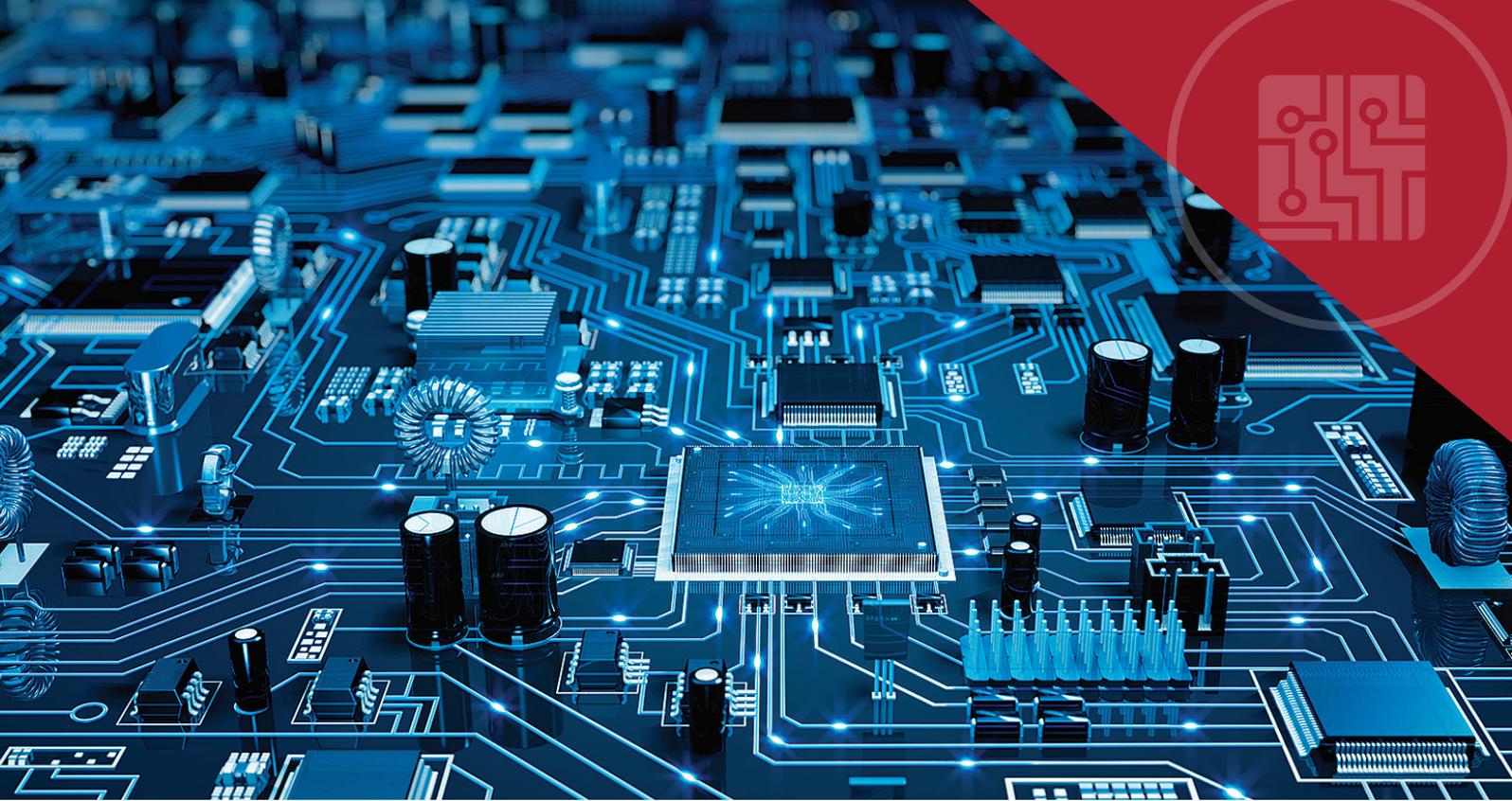
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# Asia's Factories Shaking Off COVID Gloom, China Shines

Asian factories continued to shake off the coronavirus-induced gloom in August as more bright signs in China raised hopes of a firmer recovery in global demand, reducing pressure on policymakers to take more radical steps to avert a deeper recession.

Asian factories continued to shake off the coronavirus-induced gloom in August as more bright signs in China raised hopes of a firmer recovery in global demand, reducing pressure on policymakers to take more radical steps to avert a deeper recession.

Manufacturing activity in China expanded at the fastest clip in nearly a decade in August, as factories ramped up output to meet rebounding demand, a private survey showed. New export orders rose for the first time this year.

The upbeat findings contrasted with an official survey which showed China's factory activity grew at a slightly slower pace in August.

But fears of a resurgence in infections in some economies may discourage firms from boosting capital expenditure and

delay a sustained rebound for the Asian region, some analysts say.

"In most major economies, except for China, factories are still running well below pre-pandemic capacity levels," said Ryutaro Kono, chief Japan economist at BNP Paribas.

"The recent recovery is largely due to pent-up demand after lockdown measures were lifted, which will dwindle ahead."

China's Caixin/Markit Manufacturing Purchasing Managers' Index (PMI) rose to 53.1 in August from July's 52.8, marking the sector's fourth consecutive month of growth and the biggest rate of expansion since January 2011.

Japan and South Korea both saw factory output contract at the slowest

pace in six months in August, reinforcing expectations the region's export powerhouses have past their worst from a collapse in demand after COVID-19 struck.

The spill-over to other parts of Asia, however, remains patchy. While manufacturing activity rose in Taiwan and Indonesia, they slid in the Philippines, Vietnam and Malaysia.

## PANDEMIC, POLITICS DAMPEN SENTIMENT

The global economy is gradually emerging from the health-crisis-led downturn thanks in part to massive fiscal and monetary stimulus programmes.

But many analysts expect any recovery to be feeble as renewed waves of

infections dent business activity and prevent many nations from fully reopening their economies.

Japan's final au Jibun Bank Manufacturing PMI rose to a seasonally adjusted 47.2 in August from 45.2 in July, marking the slowest contraction since February.

The survey followed data on Monday showing factory output rose in July at the fastest pace on record, as automakers ramped up production after facing factory closures in past months.

South Korea's PMI also rose to 48.5 in August from 46.9 in July, the highest reading since February, though it remained below the 50-mark threshold that separates growth from contraction for an eighth straight month.

While South Korea's exports fell for a sixth straight month in August, the trade data - first to be reported among major exporting economies - signalled a gradual recovery in global demand.

"Exports will continue to recover during the second half and turn positive next year," said Chun Kyu-yeon, economist at Hana Financial Investment. "Global demand are clearly showing recovery along with economic resumptons," she added.

### SOME ANALYSTS WARN AGAINST BEING TOO OPTIMISTIC

South Korea's latest PMI findings did not fully reflect a recent resurgence in domestic coronavirus inflections in mid-to late-August.

Japanese firms cut capital expenditure by the most in a decade in the second quarter, data showed on Tuesday, a sign the pandemic was sapping corporate appetite to spend.

Japan is also in the midst of a leadership change after Prime Minister Shinzo Abe said last week he will step down, raising uncertainty about the policy outlook.

"There is ... a risk that the leadership transition could bring about a period of policy paralysis and uncertainty, should Japan experience a run of frequent changes in premierships, as occurred prior to 2012," Fitch Ratings said in a research note.

Source: [www.channelnewsasia.com](http://www.channelnewsasia.com)



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# New Initiative with Workshops, Link-Ups with Technology Firms to Help Manufacturers Transform

Manufacturers in Singapore, especially small and medium-sized enterprises (SMEs), will get more help in adopting digital technologies under a memorandum of understanding (MOU) signed between JTC and the Singapore Business Federation (SBF). The new JTC-SBF Industry Transformation Initiative is expected to support more than 300 companies in kick-starting or accelerating their transformation journey in Industry 4.0, or otherwise known as the Fourth Industrial Revolution, in the next two years by providing them with access to relevant resources.

These include curated training workshops and capability building initiatives that are tailored to a company's level of digital readiness. Companies will also be linked up with a larger pool of technology partners, such as Siemens, Bosch Rexroth, Konica Minolta, as well as Singapore Precision Engineering & Technology Association and its consortiums, for "solution matching".

This will help companies develop the expertise to implement and scale Industry 4.0 solutions in their operations, JTC and SBF said in a joint announcement made at the Industrial Transformation Asia-Pacific (ITAP) 2020 trade show.

"Companies will gain access to successful case studies and embark on learning journeys at Factories of the Future, giving them greater exposure to Industry 4.0 solutions in real production facilities," the news release added.

"This will further encourage companies to transform and remain competitive amidst the pandemic."



## "KEY PILLAR"

Speaking at the MOU signing, Trade and Industry Minister Chan Chun Sing described manufacturing as a "key pillar" of the Singapore economy that has remained resilient amid the pandemic-induced recession, thanks to "bright spots" such as electronics, precision engineering and biomedical manufacturing.

In the first half of the year, the sector accounted for more than 22 per cent of Singapore's nominal gross domestic product. With the rise of new technology in Industry 4.0, manufacturing is evolving rapidly by becoming more automated, data-driven and environmentally sustainable.

He said, "For our manufacturing sector to remain globally competitive and continue creating quality jobs, businesses must be able to integrate these technologies into their innovation and production processes.

"Those that have been able to do so can have greater visibility and control over their operations, allowing them to respond more nimbly to any changes."

Mr Chan noted ongoing efforts to develop the sector, such as the development of the Jurong Innovation District and the launch of the Industry Connect initiative earlier this year.

The former is an advanced manufacturing hub developed by JTC, while the latter helps businesses across JTC's estates to raise their game through technology adoption and in areas such as talent development.

To date, more than 1,000 businesses in JTC's estates have been engaged through the various industry outreach initiatives, with around 200 of them embarking on Industry 4.0 transformations, said the minister. With leading players in the business community also sharing relevant technologies and experience, this has helped to create many opportunities for local businesses and their workers, he added.

## 3D-PRINTED BONE IMPLANTS

For instance, Osteopore – a local SME that manufactures 3D-printed bone regenerating implants – managed to redesign its workflow to improve productivity after being introduced by JTC to a programme by consulting firm McKinsey. As a result, the medical technology company was able to double its output despite operating at half of its manpower strength during the "circuit breaker" period.

Encouraged by the results, Osteopore plans to further automate its production process to allow 24/7 operations by early next year.

It also continues to hire and train new workers of all ages to perform higher value-add roles, including a 56-year-old former hairdresser who has successfully upskilled and now operates 3D printers, said Mr Chan.

# Ocado Adds to Robotics Capability with US\$287 Million Acquisitions

Ocado, the British online supermarket and technology group, said it would buy two robotics companies for a total of US\$287 million.



An Ocado delivery van is driven along a road in Hackney, London, Britain, April 2, 2020. REUTERS/Simon Newman/File Photo

British online supermarket and technology group Ocado said it would buy two robotics companies for a total of US\$287 million and upgraded its full year earnings outlook on the back of strong trading at its retail joint venture with Marks & Spencer.

Ocado said it was buying Kindred Systems Inc, an advanced piece-picking robotics company, for about US\$262 million and Haddington Dynamics Inc, a robotic-arm designer and manufacturer, for about US\$25 million.

Although Ocado has only a 1.8 percent share of Britain's grocery market, its state-of-the-art technology for robotically operated warehouses has spawned partnerships with supermarket chains

around the world, underpinning a stock market valuation of more than 17 billion pounds (US\$22 billion).

Ocado, whose shares were up 9.3 percent at 0941 GMT, said the purchases would enhance its robotic capabilities and accelerate the commercial delivery of robotic picking for its clients.

They also provide an opportunity for Ocado to enter new markets for robotic solutions outside of grocery.

"That is demonstrated by Kindred Systems' robust growth, with existing customers such as Gap and American Eagle across the general merchandise and logistics sectors," said Ocado CEO Tim Steiner.

The transactions will have no financial impact in the current year, Ocado said. It forecast they would increase 2021 revenue by about 30 million pounds with a small negative impact on EBITDA (earnings before interest, tax, depreciation and amortisation).

Ocado also upgraded its full-year 2020 core earnings outlook due to strong fourth quarter trading so far at Ocado Retail Ltd, its joint venture with Marks & Spencer.

It expects full year EBITDA to be over 60 million pounds, versus previous guidance of more than 40 million pounds.

"Ocado continues to see high demand as consumers migrate to online grocery in record numbers," it said.

# New Technologies, Continuous Innovation Key as World Moves towards Low-Carbon Future, Say Experts



*Birds fly over a closed steel factory where chimneys of another working factory are seen in background, in Tangshan, Hebei province, China, February 27, 2016. REUTERS/Kim Kyung-Hoon/File Photo*

Continuous innovation and the development of new technologies will play crucial roles to reduce emissions as the world eyes a low-carbon future, said industry experts at the Singapore Energy Summit.

Speaking at a panel discussion titled “Innovation: Low Carbon Innovations”, International Energy Agency (IEA)’s director of energy markets and security Keisuke Sadamori noted in order to achieve a low-carbon future and reach net-zero emissions, new technologies and innovation must play “a very big role”.

In the IEA’s sustainable development scenario, Mr Sadamori noted that one-third of the emission savings required for reaching net-zero emissions by 2070 come from technologies that are not yet commercially available.

In another assessment to achieve net zero emissions by 2050, almost half of all emission savings will come from technologies that are also not available in the commercial market, he added.

Given that this is the case, there is a need for scientists, researchers and entrepreneurs to contribute to solutions for a low-carbon future, said Mr Joseph McMonigle, who is the secretary-general of the International Energy Forum (IEF).

“This is really a call to action for all of the scientists and researchers and entrepreneurs. We need you and we need these new technologies to be created, because the problem is urgent,” he said.

“Certainly, the energy transition is inevitable. But in order for us to meet our goals, we have a lot more work to do.”

Mr Sadamori also pointed out that the technologies behind the “success stories” such as renewable batteries often require “a whole lot” more innovation.

“This may sound counter-intuitive, when we’re used to hearing the success stories that we have seen with renewable batteries, or the news about the hydrogen-based steel making,” he added.

“But the truth is that these are often technologies that still require a whole

lot more innovation. They are today at prototype for the demonstration space. And so the question whether or not we can decarbonise sectors like long distance transport or heavy industries, very much depends on the pace at which these technologies can be improved, brought to the market, and scaled up.”

In particular, about 75 per cent of all emission savings by 2050 from the long distance transport and heavy industries sectors will come from technologies that are not commercially available yet, added Mr Sadamori.

“You can see the degree that we need to rely on premature technologies and the very big role of innovation to solve this situation,” he said.

When it comes to Singapore’s experience, Professor Andy Hor who is A\*STAR’s deputy chief executive of research stressed the need for international collaborations to achieve low-carbon economy.

Citing the country’s interest in hydrogen and carbon capture utilisation and storage as an example, Prof Hor said this has created “enormous research opportunities for all of us”.

“I think this is an enormous challenge for you, for us and for everybody in the world ... I think this is where the innovations have to come and play a very key role,” said Prof Hor.

“The Singapore experience is quite clear. Number one, this is where the full system has to come together, and of course, organisational collaborations and cooperations becomes key,” said Prof Hor.

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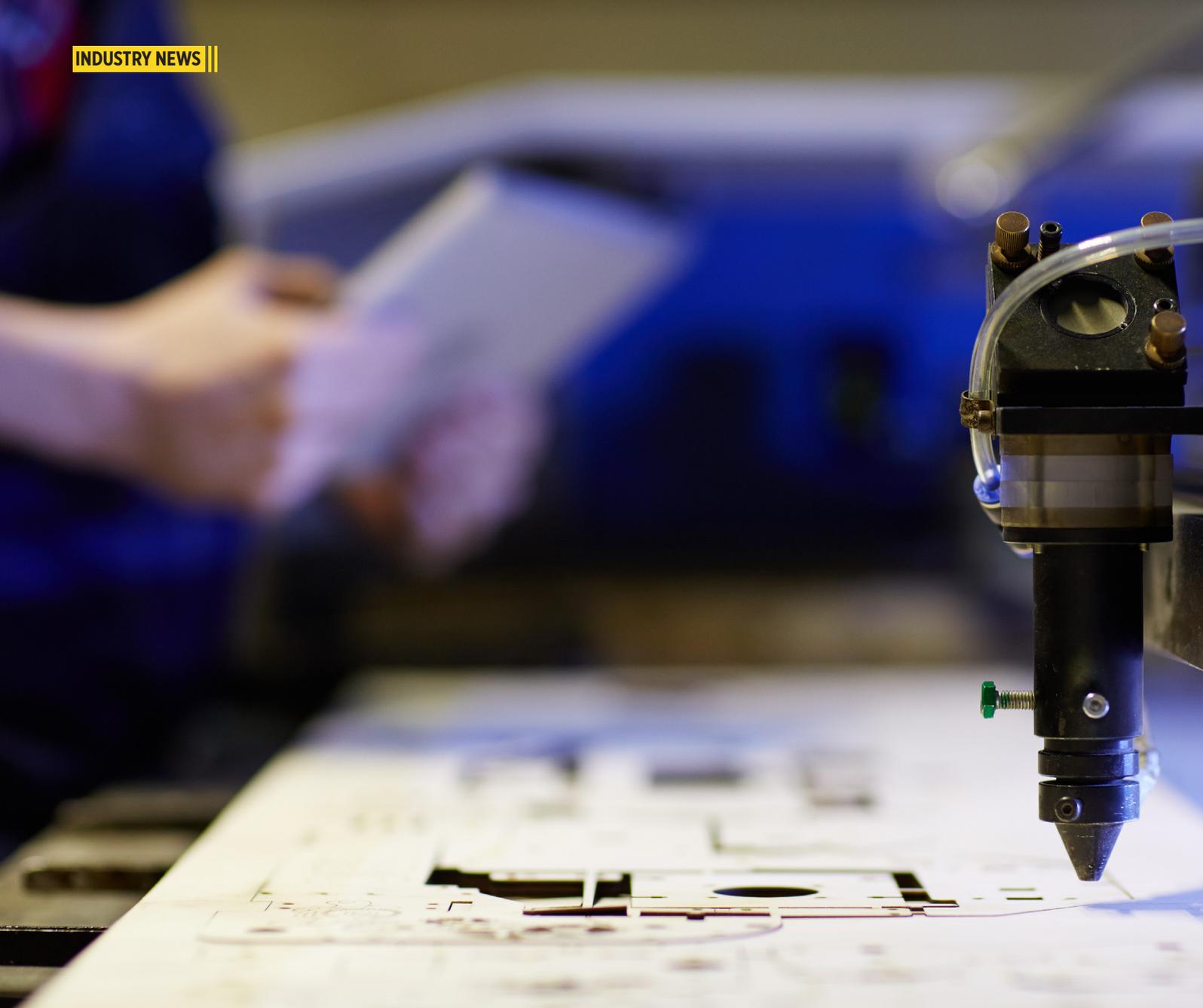
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# WEF Says Machines Will Create More Jobs Than They Destroy But Warns of Pandemic ‘Double-Disruption’

## KEY POINTS

- ◆ In a report, the World Economic Forum said the rise of machines and automation would eliminate 85 million jobs by 2025.
- ◆ But at the same time, the WEF expects 97 million new jobs to be created, meaning an overall addition of 12 million jobs.

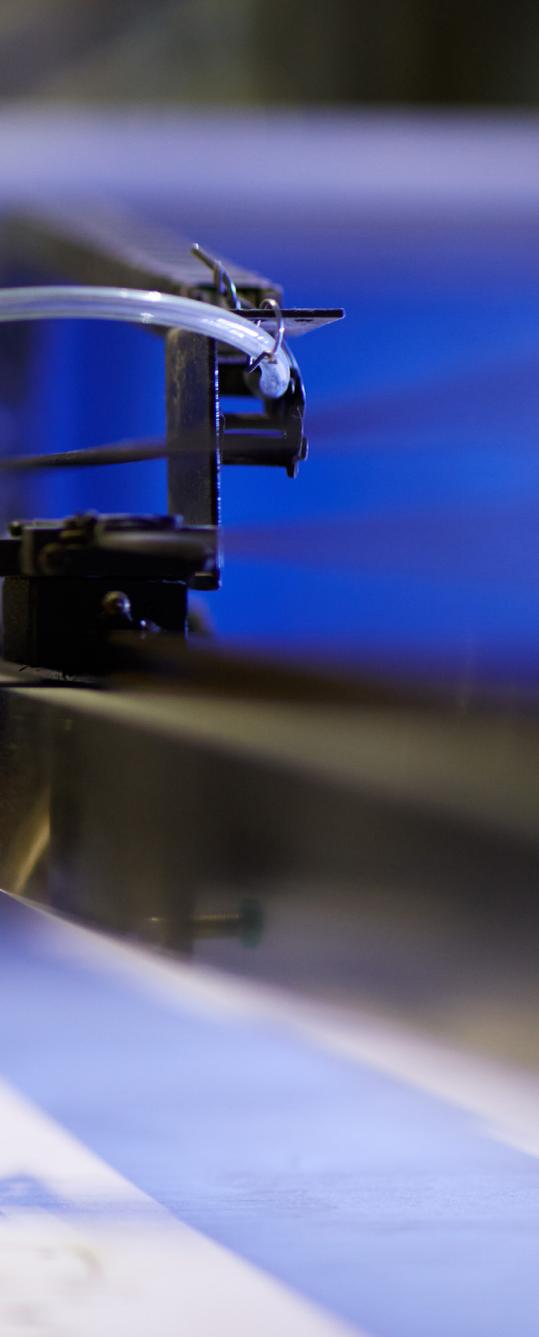
- ◆ It stressed the need for “reskilling” and “upskilling” from employers to ensure staff are sufficiently equipped for the future of work.

‘There has been a slowdown in the rate of job creation,’ WEF managing director says

Advances in robotics and artificial intelligence will lead to a net increase in jobs over the next five years but

the coronavirus pandemic will result in “double-disruption” for workers, according to the World Economic Forum (WEF).

In a report, the organization said that the rise of machines and automation would eliminate a huge 85 million jobs by 2025. But at the same time, the WEF expects 97 million new jobs to be created, meaning an overall addition of 12 million jobs.



processing, administrative tasks and routine manual jobs for white and blue collar workers.

### How coronavirus could usher in a new age of automation

That will require a significant level of “reskilling” and “upskilling” from employers to ensure staff are sufficiently equipped for the future of work. According to the WEF, half of all employees will need some level of retraining in the next five years.

“The window of opportunity that we have to ensure that workers have the right kinds of skills for the future just got a whole lot shorter,” Zahidi said. “We will need a lot more effort from business, government and workers themselves to ensure that they have the kind of reskilling and upskilling they need.”

### ‘Double-disruption’

The COVID-19 outbreak has ravaged the global economy, with the International Monetary Fund forecasting a 4.4% contraction in GDP this year due to the crippling impact of public health restrictions. The crisis has also put millions of jobs on the line, with sectors such as travel and the arts more severely affected than others.

“Automation, in tandem with the COVID-19 recession, is creating a ‘double-disruption’ scenario for workers,” the WEF said in its report. “In addition to the current disruption from the pandemic-induced lockdowns and economic contraction, technological adoption by companies will transform tasks, jobs and skills by 2025.”

The WEF also highlighted the rapid shift to remote work that came about in the spring as the health crisis led companies to close their offices. It said employers could move as much as 44% of their workforce

to operate remotely but added 78% of business leaders expect current ways of working to negatively impact productivity as some industries struggle to adapt.

These are the jobs the WEF expects to be lost to machines by 2025:

- ◆ Data entry clerks
- ◆ Administrative and executive secretaries
- ◆ Accounting, bookkeeping and payroll clerks
- ◆ Accountants and auditors
- ◆ Assembly and factory workers
- ◆ Business services and administration managers
- ◆ Client information and customer service workers
- ◆ General and operations managers
- ◆ Mechanics and machinery repairers
- ◆ Material-recording and stock-keeping clerks

And here are the new roles expected to face growing demand:

- ◆ Data analysts and scientists
- ◆ AI and machine learning specialists
- ◆ Big data specialists
- ◆ Digital marketing and strategy specialists
- ◆ Process automation specialists
- ◆ Business development professionals
- ◆ Digital transformation specialists
- ◆ Information security analysts
- ◆ Software and applications developers
- ◆ Internet of things specialists

“There has been a slowdown in the rate of job creation,” Saadia Zahidi, managing director of the World Economic Forum, told CNBC’s Julianna Tatelbaum in a TV interview. “That’s not a surprise given the lockdowns that have been underway and the recession that has followed.”

“But at the same time, if we look at the projections that heads of HR and those at the frontlines of making these decisions are saying, we find overall the rate of job creation will still surpass the rate of job destruction.”

Nevertheless, the WEF is not complacent. The institution expects work to be divided equally among humans and machines by 2025, with computers handling much of the heavy lifting with respect to data



# How do SMEs benefit from Internet of Things?

Is the technology the reserve of big players with big budgets, or can SMEs benefit too?

- Businesses see IoT as an essential element of being future-ready
- The worldwide number of IoT-connected devices expected to reach 43 billion by 2023 – a full threefold increase from 2018
- But is the technology the reserve of big players, or can SMEs benefit too?

The rise of the Internet of Things (IoT) has been rapid. Worldwide, the number of IoT-connected devices is expected to reach 43 billion by 2023 – a full threefold increase from 2018 according to McKinsey, which will amount to a market forecast to surpass US\$176 billion by 2022.

IoT devices represent the physical manifestation of the digital transformation taking place around us. Use cases are vast – hardly any industry is exempt from its benefits. In the utility sector, for example, sensors in water pipes could feedback maintenance data to programs that predict when fractures are likely to occur. In precision agriculture, crop health can be revealed thanks to sensors that measure light, humidity, temperature, soil moisture, and feed it back to farmers. In healthcare, chronic condition monitoring will drive the most IoT endpoints. And in automotive, IoT connectivity manifesting in a range of ‘add-on’ devices, accomplishing tasks such as fleet management. Aviation, construction, logistics, and transport are among so many others that are reaping the advantages.

But, while we may think investments in IoT are the reserve of only the largest manufacturers or airlines – where the technology would just be one of many initiatives among blockchain and AI for example – smaller-scale businesses can access and benefit from IoT, enabling new ways of working.

According to Vodafone’s 2020 IoT Spotlight report, businesses see IoT as an essential element of being future-ready, with 73% agreeing that organizations who fail to embrace IoT will fall behind within just five years. Erik Brenneis, IoT director at Vodafone Business said IoT has “grown-up”, becoming an essential technology for businesses that want to be resilient, flexible, and quicker to adapt to change.

Here are three ways SMEs can leverage IoT for a competitive advantage.

## #1 | Operations, inventory, and logistics

Everyday, the automated warehouses of online-only retailer Ocado sorts orders using robotics, software, and barcodes – all of which eliminate the need for people, and have enabled the retailer to overtake more traditional supermarket competitors.

Smaller businesses today can use barcodes, radio-frequency identification (RFID) tags, and IoT devices for inventory control. A combination of the Internet of Things and RFID can create 'smart stores' that are equipped with sensors and cameras to allow remote and centralized inventory management, including automated restocking. Small businesses can also adopt IoT robotic carts to make delivery fully automated and controlled by a central app or system.

Elsewhere, the Internet of Things can help provide end-to-end visibility of deliveries, especially where long-distance shipping is concerned about feeding connected tracking device data into transportation management and supply chain platforms. The increased visibility at specific stages of the journey also gives businesses a competitive advantage by highlighting areas of inefficiency.

In addition, IoT offers deeper insights into supply chain data for the condition of stock like perishables, allowing businesses to verify the quality of deliveries. This data can be used for data-led risk assessments or improve certain aspects of processes, while connected devices can gather emissions data to keep them in line with regulations to proactively manage cargo as needed.

## # 2 | Workspace efficiency

As artificial intelligence, machine learning and natural language processing (NLP) software develop, voice assistants have improved to be able to take notes, set reminders, and deliver alerts. Microsoft's Cortana and Teams software have both incorporated IoT technology to enable note taking, set reminders, and deliver emails on the go.

Besides the benefits of productivity, businesses are using voice assistants to offer better customer service and increase revenue by reducing costs. In a bid to improve products and services, and reach new audiences, products are being integrated or optimized for assistants like Siri and Alexa, while chatbots are continuing to deliver efficiencies and valuable data to businesses.

Considered a precursor to smart devices, thermostats were able to manage heating based on a preset temperature. IoT

improves a businesses' ability to manage environments across large premises remotely, with some devices able to implement machine learning to increase efficiency and cost savings further. Heating and ventilation costs consume up to 40% of a total building's expenditure – IoT sensors can identify inefficiencies in these systems, enabling businesses to save electricity consumption and costs.

## # 3 | Security and access

In contrary to most business concerns in adopting IoT, security can actually be improved. Smart locks not only provide small businesses added convenience in managing building access from any device, but also provide increased security. With smart locks, if an employee loses their key, they can control locks from phones or other devices, while unique access codes can be effective in managing and tracking who enters a building.

With the assistance of cloud computing, connected cameras also allow businesses to remotely monitor offices, warehouses, entrances, and other areas. Their wireless capabilities in using Wi-Fi also make installation easy and is also part of the reason why the technology's implementation is so affordable.

IoT has been the most transformative and innovative technology, and as it continues to mature more connected devices and IoT technologies will emerge. From wearables to alarm systems, access management to machine learning (ML), there is no doubt the Internet of Things will continue to revolutionize our daily lives.



# The Internet of Space: Non-Terrestrial Network Path Emerges for Satellite IoT



**Nancy Friedrich**  
Industry Solutions Marketing, Aerospace & Defense, Keysight Technologies

With so much attention placed on 5G non-terrestrial networks and enhanced defence capabilities, it is easy to forget about the satellite Internet of Things (IoT). Also sometimes called the “Internet of Space,” this next wave of connectivity is predicted to enable many new applications while improving existing ones. In addition to consumer technology and services, aerospace defence applications and capabilities stand to greatly benefit.

With 5G, satellite IoT gains range, power, and speed. Early satellite IoT has so far comprised lower earth orbit (LEO) networks, which specifically target IoT applications and services. Yet the Third Generation Partnership Project (3GPP) has pursued a vested interest in how non-terrestrial networks can augment the 5G infrastructure. It has also partnered with the European Space Agency on the Satellite for 5G project.

Although non-terrestrial networking is a boost for mobile broadband, it also can fill a necessary gap for machine communications.

Specifically, it could satisfy requirements for massive machine type communication (mMTC). The 3GPP has included plans for service for mobile IoT. If these capabilities indeed extend to previously underserved areas, the rewards could be substantial.

One large application example is a smart city or even a smart larger town in a more rural area. Such locales may want connected and intelligent meters, lights, and more. The eventual goal of most “smart cities” is for everything to be connected, with city infrastructure communicating to driverless or assisted vehicles, for example. To cover a wider or more populated area, satellites will likely form a constellation to support sensor networking.

The potential benefits of mMTC also extend to aerospace defence applications. With the ability to collect millions of devices within a few kilometres, you can utilize a 5G network to collect and share sensor data.

According to an article from Finabel – the European Army Interoperability Centre, “With a smartwatch and wearable devices, it will be possible to have lots of information to share about soldiers: from their vital parameters, such as heart rate, blood pressure and fatigue, up to their geographical position then you could even get to use augmented reality devices similar to Google Glass, a bit like those already supplied to pilots, but with real-time data transmission.”

When it comes to rolling out this technology, different approaches are being developed and demonstrated to verify what is currently viable. In MediaTek’s field trial, for example, data was transferred through Inmarsat’s Alphasat L-band satellite in Geostationary Orbit (GEO). With this bi-directional link from an NB-IoT (narrowband IoT) device to a GEO satellite, the possibility of worldwide IoT coverage became more possible.

It also proves the potential for a hybrid approach that incorporates both cellular and satellite networks. The results of MediaTek and Inmarsat’s IoT field test will be contributed to the 3rd Generation Partnership Project (3GPP)’s Rel-17 standardization work on Non-Terrestrial Networks (NTN).

As 5G makes much more information available, mMTC will increase the ability to leverage sensor data. As a result, warfighters will have increased situational awareness and more data ranging from the status of their soldiers to insights from equipment. Expect 5G to greatly impact the information gathered on the battlefield.

At Keysight, we cover the satellite development and deployment cycle from inception through deployment. We also support 5G design and developments. Visit our Space/Satellite and 5G sites to find out more.

# Start Digitalization Towards Smart Manufacturing

## Machine Status Monitoring Solution



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Enabling an Intelligent Planet

### Machine Status Monitoring Solution

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# Industrial Augmented Reality Promises Remote Support



*Industrial augmented reality is picking up steam during the pandemic.*

Key takeaways from this article include the following:

- Industrial augmented reality is growing up, shedding its novelty status.
- While augmented technology remains expensive, workplace restrictions in the industrial sector are fuelling interest in AR-based remote support.
- The uses of AR in the industrial sector are set to expand as end users and vendors continue developing bespoke applications for the technology.

Interest in industrial augmented reality is surging in 2020, potentially paving the way to broader mainstream use of the technology.

It wasn't long ago, however, that the use of augmented reality (AR) in industrial environments seemed like little more than a trade show curiosity. The technology, which overlays computer-generated graphics on top of a user's view, had

potential for training or remotely assisting workers in plants and factories. But similar to virtual reality (VR), user acceptance and hardware capability were challenges.

While the concept of using the technology in industrial settings dates back to the 1990s, adoption of industrial augmented reality was limited. "Lots of companies have played with AR and VR," said Alex West, senior principal analyst in Omdia's Industrial IoT segment. "But in many cases, it was trailing. It wasn't mass-deployed."

Some of the most famous augmented reality applications come via the consumer sector. Pokémon GO and Snapchat lenses have won widespread followings in recent years. But the technology has seen significant failures as well. Google Glass, consumer-focused AR-enabled smart glasses, flopped in 2014, leading the company to focus on the technology's enterprise and medical applications.

Magic Leap, an AR start up that raised \$2.6 billion in capital, has seen its valuation plunge 93% from \$6.4 billion in 2019 to \$450 million in June 2020, according to the Information. And industrial-focused AR company Daqri reportedly went out of business last year.

In the industrial realm, augmented reality's entertainment links were a hurdle. A few years ago, industrial AR still seemed like a gaming technology, said Andrew Ellis, director of global information software technical consultants at Rockwell Automation. "You looked at it and thought: 'This looks pretty cool as part of the Industry 4.0 technologies, but who is really going to use this?'" he said.

"I think that AR technologies are still effectively in their infancy," said Randall Kerr, senior strategic account manager at Digi International. "Still, there's no question that the capabilities of augmented reality are vastly greater than they were just a few years ago."

This increase in capabilities has in recent years fuelled new interest in augmented reality for industrial applications, according to analysis from ARC Advisory Group. In particular, industrial augmented reality has found growing traction with the surge of remote work. "There's a lot of opportunities to do training using [AR and VR] technology where people don't have to be in the physical facility," said Richard Howells, vice president, solution management for digital supply chain at SAP.

Despite initial scepticism, a growing number of industry professionals are realizing AR's potential, Ellis said. "I

now position augmented reality data historians 25 or 30 years ago,” he said. (Data historians, which store operational data in a time-series database, have become commonplace and a foundation for many IoT analytics projects.) When it comes to augmented reality today, there are parallels from early historian adoption, Ellis added. “There is a fair amount of education required for users [concerning AR], and there has to be a clear path to value.”

According to IDC, global spending on AR and VR technology is expected to increase by 78.5% in 2021. ARC Advisory Group has expected industrial AR to grow at a 20% compound annual growth rate. COVID-19 has ramped up interest in augmented reality, Ellis said. “AR is part of the discussion with almost every customer.”

### **Overcoming Cost Questions and Other Challenges**

While the concepts of virtual and augmented reality have decades of history, mainstream adoption has been elusive. Smartphones and tablets support AR functionality but offer a less-immersive user experience.

Until recently, augmented reality headsets were either bulky or had limited computing capabilities and battery life. Most cost thousands of dollars. Comfort is another consideration, West said. “I’ve used a couple of [headsets], and I would not be able to use them for an extended period,” he said.

But hardware is steadily advancing, as is the ergonomic fit of recent hardware. And end users have a growing variety of AR hardware.

Some industrial-focused AR hardware supports use in hazardous environments. The HMT-1 headset from RealWear, for instance, complies with Class I, Division 1 electrical requirements designed for environments where explosions are a risk.

Prominent AR headsets remain expensive, however. The RealWear HMT-1 costs \$2,520, while the Microsoft HoloLens 2 is \$3,500 (a price tag that can approach \$5,000 when developer licensing is added).

“When you look at supporting 10,000 or 12,000 field people across the industrial businesses and then supporting organizations, the numbers get pretty high pretty quickly,” said Kevin Doyle, vice president, commercial digital solutions at Ecolab.

The development and integration work many industrial AR applications require can be a significant hurdle as well. “There really aren’t any ‘click-fit’ types of implementations at this point,” Kerr said.

### **Remote Support and Service**

But in many cases, those costs can be justified given the use of AR for remote support and service, Doyle said. Traveling field service technicians have traditionally racked up considerable costs. But given worker restrictions within many plants in light of COVID-19, companies like Ecolab are presenting augmented reality as a means of saving money. “We started out hearing customers say, ‘Man, that’s super expensive,’” Doyle said. “Now we are hearing, ‘Wow, after a month’s worth of travel, you basically paid for it already.’”

For Ecolab, which specializes in water, hygiene and infection prevention technologies, travel had been a vital part of its operating model. In the past, the company had more than 30,000 workers who traditionally entered industrial facilities (ranging from refineries to pharmaceutical and food-and-beverage plants) to service equipment and identify operational savings. “COVID-19 has really exacerbated our need to provide consultative service,” Doyle said.

Having experimented in the past with augmented reality for training and marketing applications, Ecolab turned to

augmented reality technology to provide remote support to clients in the middle of a pandemic. “It’s allowed us to get our experts around the world to share their knowledge [with customers] without having to get on a plane to do it,” Doyle said.

A large brewer, for instance, recently experienced significant water loss. “They had some sort of leak in a valve, but they were having trouble isolating where this leak was happening,” said Phil Stein, vice president, commercial digital solutions at Ecolab. In the past, Ecolab would have flown an employee to the brewery to troubleshoot. But using augmented reality, an employee was able to communicate with an account manager to “visually walk through a plant line and figure out where this water leak was coming from,” Stein said. Collaborating via augmented reality, the companies identified two valve leaks.

While augmented reality technology is beginning to prove its value for remote service, the technology is still expensive for some customers. In cases where dedicated AR headsets are cost-prohibitive, organizations that don’t require hands-free functionality can consider smartphone- or tablet-based AR.

AR technology can help some organizations protect workers from COVID-19, but safety could be a short-term hurdle. “Imagine a line worker 50 feet in the air doing maintenance on the power grid. That person needs to be focused on hanging on,” Kerr said. Wielding AR technology in such a case would be a big request.

In the long run, though, the use of industrial AI is set to expand as vendors and their customers continue to develop custom applications for the technology. “The problems we see with AR now will be worked out,” Kerr said. “It’s just a question of when, and which players will ultimately still be standing.”

# IoT Device Takeovers Surge 100 Percent in 2020

The COVID-19 pandemic, coupled with an explosion in the number of connected devices, have led to a swelling in IoT infections observed on wireless networks.

Connected cameras, refrigerators and other seemingly-mundane internet-of-things (IoT) devices are a cybercriminal favorite this year, with new research showing a sharp increase (100 percent) in IoT infections observed on wireless networks.

IoT devices are now responsible for 32.72 percent of all infections observed in mobile and Wi-Fi networks – up from 16.17 percent in 2019. Researchers with Nokia's Threat Intelligence Lab said, in the Threat Intelligence Report 2020 released this week, that they believe that number of IoT infections will continue to grow "dramatically" as connected devices continue to populate in homes and enterprise settings alike.

"It's not a surprise that IoT devices are the crown jewels for cybercriminals," Dirk Schrader, global vice president at New Net Technologies, told Threatpost. "Businesses around the world are transforming their processes, their production lines using digitalized assets. Having control over these assets means that a cybercriminal's hand is – literally – at the main switch of a digitally transformed company."

IoT devices are even a target for ransomware, he added: "The danger of being shut down almost completely is the reason why companies are more likely to pay even higher ransoms."

Researchers pointed to the visibility of devices connected to the internet as a barometer for IoT infection rates, with high IoT infection rates occurring when devices are connected to publicly facing internet IP addresses. In networks where carrier grade network address translation (NAT) is enabled on a firewall or router, the infection rate is reduced, as the connected devices are not visible to network scanning, they said. While standard NAT translates a private IPv4 address to public IPv4 address, carrier-grade adds an additional translation layer as an extra security measure.

There are more and more devices for cybercriminals to scan: Brandon Hoffman, CISO at Netenrich, pointed out that due to the pandemic, people are also not spending money on vacations and therefore buying more connected "things" for their homes.

"As devices at home and other 'things' become smarter, and have computing capacity they don't need, cybercriminals can snap that computing power up and use it to perform attacks, transfer data anonymously, and store it in places people aren't looking," Hoffman told Threatpost.

Overall, in 2020, Android devices were the most commonly targeted by malware, researchers found, making up 26.64 percent of all infections. Meanwhile, Windows devices and PCs, which are increasingly connected to mobile networks via USB dongles and Wi-Fi, made up 38.92 percent.

Researchers said that the coronavirus pandemic caused a surge (a 30 percent increase over 2019, specifically) in mobile-malware infections, saying the volume and type of attacks have also seen "profound" changes.

"The situation is certainly worsened during the pandemic, as the IT operations and information security teams had to organize, setup and secure a remote workforce more or less in no time," Schrader said. "Plans for digital transformation need to be altered to reflect this 'new normal,' and such the problem is likely to worsen."

IoT devices have long been under scrutiny for their lack of security measures, with researchers finding in March that more than half of all IoT devices are vulnerable to medium- or high-severity attacks, for instance.

In September, researchers found a Bluetooth Low Energy (BLE) vulnerability that impacted billions of IoT devices and remained unpatched in Android devices. And in August, researchers urged connected-device manufacturers to ensure they applied patches addressing a flaw in a module used by millions of IoT devices.

Meanwhile, the growth in IoT is far from over: The introduction of 5G is also expected to continue to increase not just the number of IoT devices, but the share of connected devices accessible directly from the internet.



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# Robots Get Private View of Major Pop Art Show

London's Saatchi gallery is holding a private viewing for robots and humans, allowing people and machines to wander through the wacky world of pop artist Philip Colbert in a show designed to work both digitally and in real life.

The show displays work featuring Colbert's cartoon lobster, the central character in his paintings and sculptures. Telepresence robots - remote-controlled robots on wheels with cameras and a tablet screen are on offer for those who don't attend in person.

"I wanted to stage my exhibition opening using these telepresence robots as almost like a sci-fi vision of a possible future, where we have a telepresence robot which

goes out into the world for us so we stay protected at home," Colbert told Reuters.

"I felt that that was not only a way of making the show more accessible but also creating a more fantastical vision of the future... it is very possible that people could be physically required to be present and are not able, so hence they have a robot presence somehow," Colbert said.

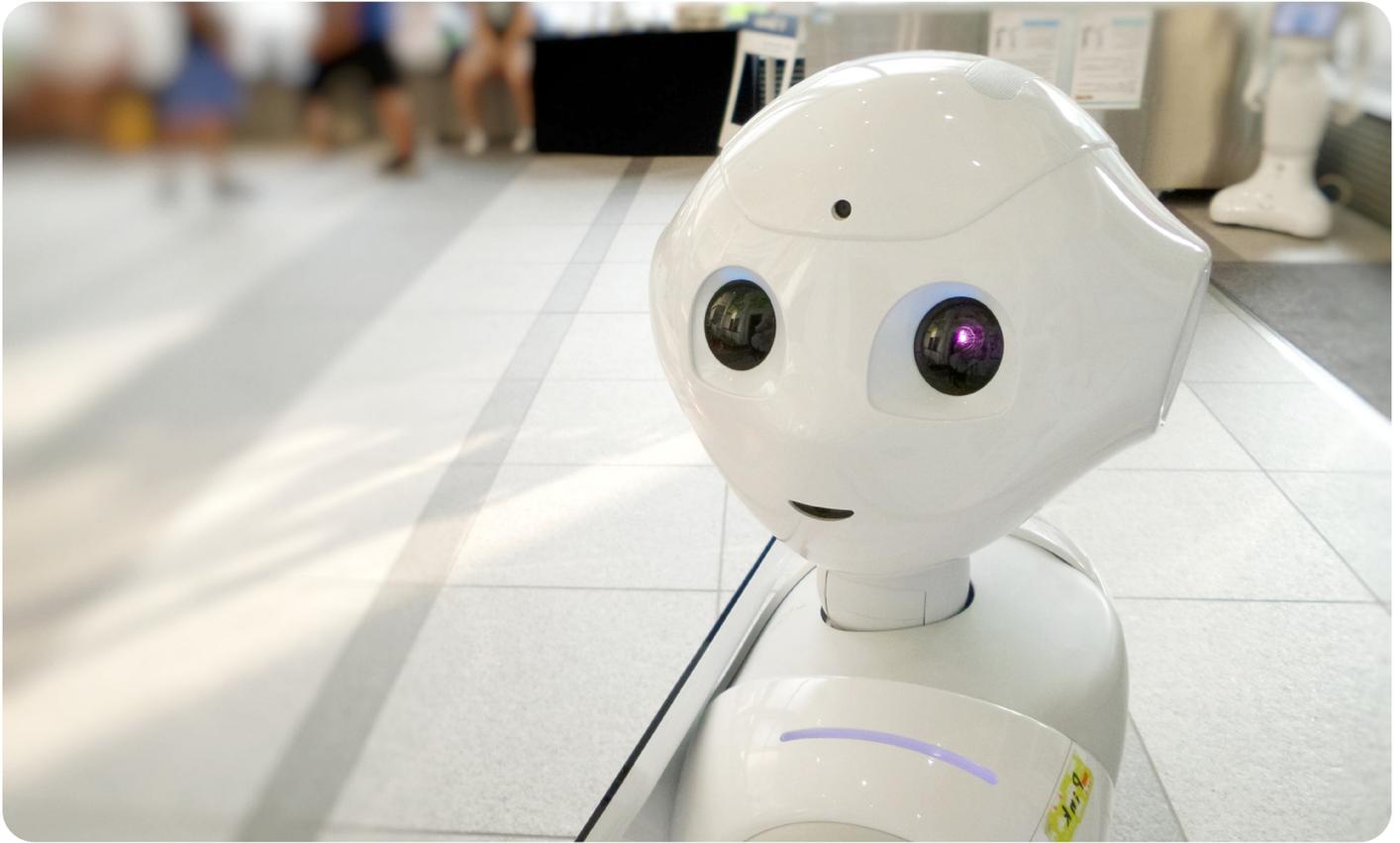
Guests can tour the gallery in person or by booking a robot which they can then navigate through the space, zooming in and out on works exploring mass consumerism, contemporary culture and history.

"It's quite incredible to be driving round Saatchi," said Josh Corden, an artist and preview invitee. "I think it's incredibly powerful," he said from east London. The idea for the show was born during lockdown isolation.

Auctioneer Simon de Pury attended the show through a telepresence robot which he controlled from his home in Monaco.

"This is a wonderful way of attending an auction preview or an exhibition preview. You can get close up to the artwork, you can have a look at it from near, from far and you get an idea of proportion so it's a pretty cool way of looking at art."

# COVID-19 Robocop: The Droid That Reminds You to Wear Your Mask



Engineers have developed a robot that can detect whether people are wearing a mask to guard against COVID-19 and, if not, politely remind them to put one on.

The feature is an upgrade of Pepper, a 120cm high robot with human-like features that is already in operation in some countries welcoming visitors to shops, exhibitions and other public spaces.

Pepper's camera scans the faces of people approaching it, and if it detects the lower half of their face is uncovered, it pronounces the phrase: "You have to always wear a mask properly."

If it sees that the visitor then puts on a mask, the robot follows up with the phrase: "Thank you for having put on your mask."

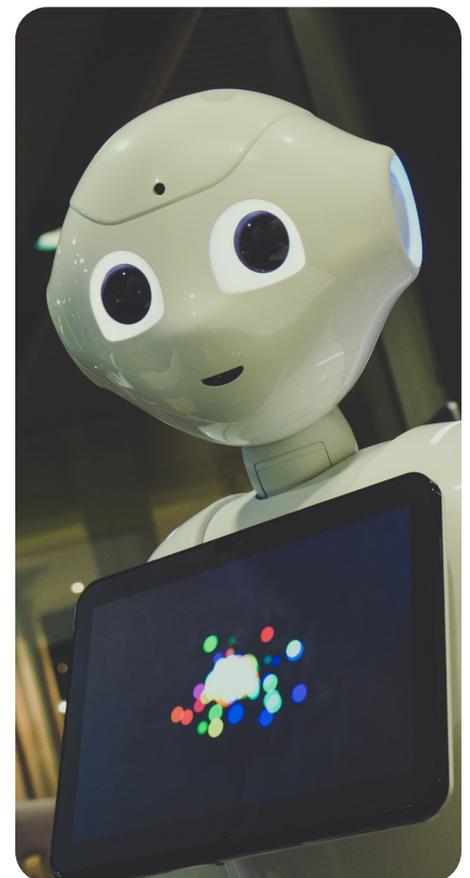
The idea is not to have a robot police whether people are wearing masks, but

to provide a friendly reminder, said Jonathan Boiria, head of sales in Europe for SoftBank Robotics, the company behind Pepper.

"Shops have to assign people at the entrance, a lot of people, to ensure respect for the wearing of masks, and sometimes that is a stretch," Boiria told Reuters in Paris.

"A robot allows you to free up some people so they can focus on their normal tasks."

"We're all human. Sometimes I take off my mask when I get off the bus and I forget to put it back on when I arrive at the office. The robot provides a reminder. We can all get it wrong or forget."



# Can Robots Help to Save the Ailing F&B Industry?



*A robot bartender called Ratio.*

They can mix a cocktail as fast as a human bartender can, and make coffee that tastes almost as good as a master's brew, but can they address the declining footfall in F&B outlets?

Over the years, restaurant owner Jerry Singh has been constantly “fighting with other (food and beverage operators) to find bartenders”. It takes him between two and six months to hire a bartender. Even when he finds one, the turnover rate is high.

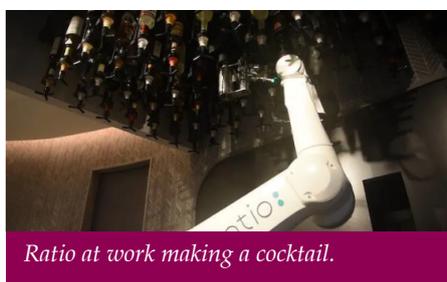
“We’re reliant on people who treat (bartending) as a career, but sad to say, not many Singaporeans treat this as a career,” he lamented. “We’ve offered all kinds of bonuses, such as commitment bonuses in months four and seven. We dangle the carrots, and it still doesn’t offer any guarantee that the guy will stay.”

This is why, for his new restaurant in Seletar Aerospace Park, he is leveraging a robot bartender system called Ratio — developed by Singaporean company Ross Digital — to alleviate that manpower crunch.

This bartender can make a cocktail in under two minutes: The robotic arm picks up a glass or a shaker, fills it up with alcohol from the bottles hanging from the ceiling, mixes it and slides it to the customer. Ratio is a collaborative

robot, or cobot, which is designed to work alongside humans in shared spaces.

And with the coming of this new incarnation of robots, some F&B players are hoping there are ways it could help their ailing industry.



*Ratio at work making a cocktail.*

## Robots to Preserve Kopitiam-Style Coffee?

Ratio was created in 2018 by Singaporean Gavin Pathross, chief executive officer of Ross Digital, as he saw a push for automation in the F&B industry. The company officially launched the Ratio Robotic Cafe and Lounge at The Centrepoint.

Robots, he noted, can be programmed to do the repetitive and what some people consider the dirty work that “nobody really wants to do”, including washing dishes and flipping burgers. Some robots,



*Ella also has a voice that tells customers their coffee is tbeing prepared and when it is ready.*

like Ratio, can do more complex jobs, like making coffee and cocktails, he said.

He even thinks robots may potentially help to preserve kopitiam-style coffee-making when nobody else wants to earn a living making the S\$1 cups of coffee that the old “tao chiew” (coffee brewers) now sell.

To create that authentic style of coffee, he had engineers work with several skilled brewers to understand their craft so that Ratio would be able to replicate what they do. “Through trial and error we’ve managed to almost perfect it,” he said.

After a tasting session, Ebenezer Coffee Manufacturer managing director Andrew Sim said the brew made by Ratio almost matched the taste of traditionally brewed coffee.

It was enough for him to believe that such robots can take over the ‘tao chiew’ role in future. “(The) robot-made coffee will be very consistent (while the) ‘tao chiew’ coffee will be quite inconsistent,” he said. Earlier this year, local start-up Hawkermatic also launched a machine that can make a consistent cup of kopitiam-style coffee after its founder, Jason Thai, could not find a skilled brewer for his canteen-style coffee shop at Infinite Studios in one-north.

Then there is Ella, a state-of-the-art robotic barista created by Crown Group’s technology arm, Crown Digital. The company is now seeking to expand Ella’s market presence in Singapore and beyond.

Ella also has a voice that tells customers their coffee is being prepared and when it is ready. Introducing kopitiam-style coffee (Nanyang-style coffee) to international markets is also something Pathross hopes to do.

“We’ll take that technology overseas to Europe and the United States, where we can serve homesick Singaporeans (and) expose the Americans and Europeans to Nanyang coffee,” he said.

### More Efficient and Reliable

According to him, the use of robots can also help to mitigate some of the costs in the F&B industry, which has been greatly challenged by rentals, wages and the cost of ingredients. The cost of leasing Ratio is between S\$2,500 and S\$3,500 a month, which is comparable to the average salary of F&B service staff, including bartenders.

“But what you get is about three to four times the efficiency, depending on how long you want the robot to work,” said Pathross, adding that a robot can work 24/7, has almost no downtime and “typically doesn’t fall sick”.



“Robots are generally quite good in not wasting or making wrong drinks, which means (they) can reduce the cost of ingredients.”

A well-trained barista can make up to 60 cups of latte an hour, but a robot probably doubles that, he reckoned. Singh, whose monthly lease on Ratio includes kitchen equipment such as ice machines, chillers and coffee equipment, agrees that the robot will be more efficient and reliable.

He met Pathross about a year ago in Shanghai, at a pop-up cafe-bar with this robotic bartender, and was convinced that this technology would be able to serve the F&B industry, since “we’re cursed by manpower crunch issues”.

“There’s always that issue of unreliable staff and high turnover. The only way to eradicate it will be (automation),” said Singh. “It’s almost impossible to find good, reliable bartenders to stay with you too. They’d want to move around.”

### A Crowd-Puller?

To test the robot’s speed, CNA Insider set up a friendly contest between Ratio, Sim and bartender Sylvia Yee. The robot took about 10 minutes to make a cup of Nanyang-styled tea, which included the act of “pulling” the tea, whereas Sim took three and a half minutes. (The company has since said it managed to reduce the time taken to three and a half minutes as well.)



*The Singapura Aerospace Club is set to open this month. (Photo: Jerry Singh)*

To make a Tom Yum Martini, both robot and human took one and a half minutes, which impressed Yee. But she was not worried about losing her job to robotics.

“The human bartender will still be the one to come up with a cocktail recipe or come up with a new cocktail trend,” she said. “(Robots) still need to work together with a very experienced bartender.”

In fact, that is what Singh has planned for when his new restaurant, The Singapura Aerospace Club, opens this month: A bartender to attend to his customers while Ratio makes the cocktails in the background.

“It’s still a people business. We aren’t going to become a faceless business. The human touch will still be there — it’ll never be taken away,” said Singh, who also runs The Singapura Club restaurants on Haji Lane and Dunlop Street.

But he hopes the robot bartender can help to bring in the crowd too, at a time when footfall in F&B establishments is declining because of COVID-19.

“It’ll be a cool novelty for them to see how a robot bartender works. This innovation will appeal to the young and the old,” he said. “Not many have seen this kind of technology.”

Lawrence Loh, an associate professor of strategy and policy at the National University of Singapore Business School, thinks the concept’s novelty value can draw people to such establishments, at least initially. “But it may not be indicative of a sustained demand,” he said. “In the long run, (the F&B outlet) must still have a value proposition and a unique selling point.”

# The Amazing Ways Duolingo Is Using Artificial Intelligence to Deliver Free Language Learning

It's a challenge to learn a new language, especially once we're past 18 years old. Duolingo, self-proclaimed as "the world's best way to learn a language" and seconded by reviewers at the *Wall Street Journal* and the *New York Times*, is set to change that with an assist from artificial intelligence (AI). Duolingo launched in 2011, and through a powerful mix of personalized learning, immediate feedback and gamification/rewards, it has become one of the most downloaded educational apps today. Let's take a look at how artificial intelligence helps the company deliver personalized language lessons to its 300 million users.

## Duolingo on a Mission to Offer Free Language Education

Founded in Pittsburgh by Carnegie Mellon University computer scientist Luis von Ahn, who is renowned for creating CAPTCHA, Duolingo's mission is to "make education free and accessible to everyone in the world." Today the company's more than 300 million users receive personalized training on more than 30 distinct languages ranging from Spanish to Navajo to Klingon through its cross-platform app. Learning a language is time-intensive—the U.S. State Department estimates it can take 600 to more than 1,100 class hours to learn a language. Duolingo breaks this effort down into manageable chunks that can be done anywhere at any time individualized for each user and infused with fun and a points-based reward system. Users can access the app for free, but those who don't want ads can sign up for premium service through a monthly subscription.

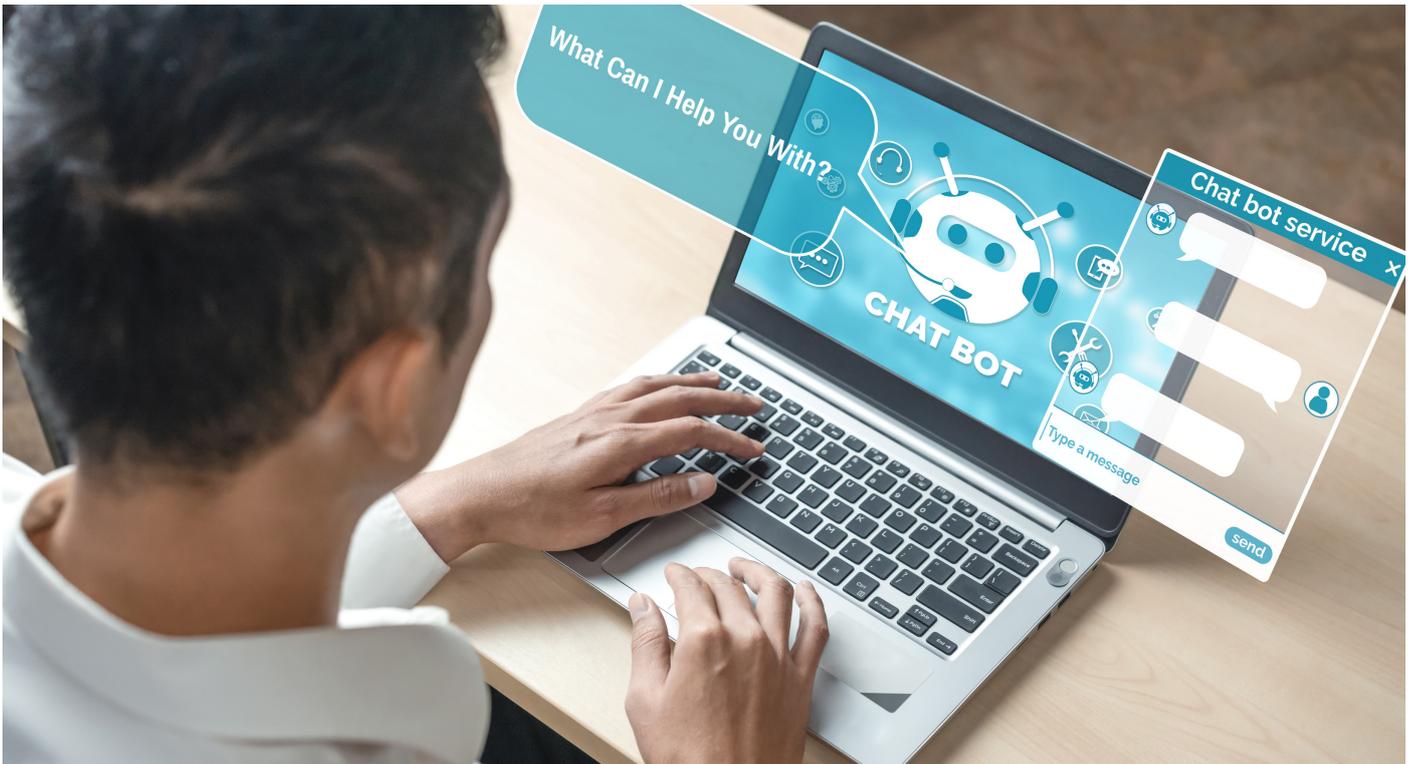


## AI Powers Duolingo's Mission

Artificial intelligence is behind Duolingo's mission to make language education accessible and free to everyone. It starts with an AI-driven placement test to determine the starting knowledge of each user for the language they want to study. For example, if someone signed up to learn French and they have four years of instruction in high school, they will likely be able to start Duolingo's lessons further along than a user who had never been exposed to French before. To determine exactly where each user's understanding of the language begins, the placement test adapts as it continues based on if the user

answered the previous question correctly or not. In a mere five minutes, this test gives the app a good sense of where each user should start the course. This ability contributes to a positive user experience and reduces the number of those with some knowledge bowing out due to boredom at the beginning.

Another core feature of the Duolingo app that uses artificial intelligence is known as spaced repetition. This concept delivers personalized language lessons over longer intervals for optimal learning rather than cramming lessons into a short period of time. Additionally, the "lag effect" is also important to Duolingo's



learning techniques. If the gap between practice sessions is lengthened, users improve more. All of this content delivery is controlled on the backend by artificial intelligence.

As learning expands and language proficiency is gained, the user interacts with the content in different ways. AI algorithms using deep learning predict at any given moment the probability of a user being able to recall a word in a given context and then can figure out what that user needs to keep practicing. The algorithms analyze user data to then personalize the learning experience.

### Protecting Child Migrants During A Pandemic

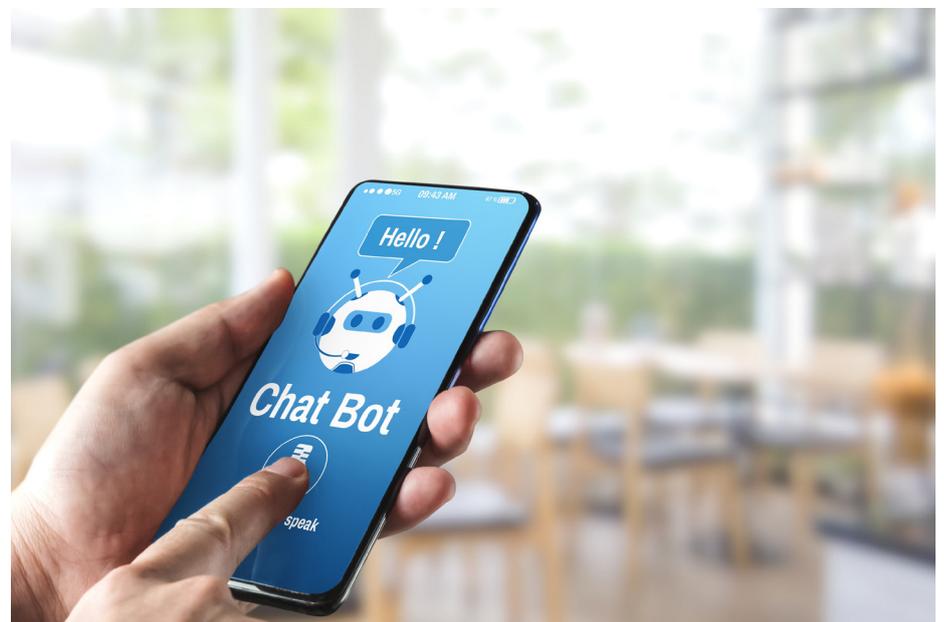
In fact, Duolingo generates a wealth of data that is critical when creating predictive models. The amount, type, and uniqueness of the data was one of the reasons the company's AI and research lead Burr Settles decided to join the company in 2013 over bigger, more established companies. Duolingo's half-life regression statistical model operates based on analyzing error patterns of

millions of language learners to inform content delivery that's relevant for each user and their learning needs.

In an effort to ensure an engaging experience, Duolingo has AI-powered chatbots that help teach language through automated text-based conversations with users who are in the app. Not only do the bots help users improve their language skills by helping them practice conversing in a language, but they get smarter the more they are used. The company has also

considered the possibility of expanding into virtual reality technologies to deliver a more immersive experience.

As with any artificial intelligence, the more users engage with the AI, the better it gets. And the better the AI gets, the closer it is to mimicking human language instructors. As the artificial intelligence of Duolingo gains expertise, it's helping millions of people worldwide acquire new language skills.



Source: [www.forbes.com](http://www.forbes.com)

# Bringing Agile & 4.0 to the Upstream Energy Industry

**ALECA is the first independent software to integrate all experts!**



## Cloud-based multidisciplinary collaboration

Dashboard	Approvals	Location	Horner's Plot
Scope of Work	Choose Your Experts	Risk Register	Pressure
Deliverables	Schedule	References & Analogues	Play Risk
HCIIP	Tornado	DCA Forecast	Gas Material Balance
			Georisk Pg

## GLOBAL EXPERT NETWORK



**Need a Consultant? ALECA Global Expert Network has you covered!**

*ALECA module-based toolbox has technical & commercial tools for all disciplines to efficiently evaluate any investment opportunity.*

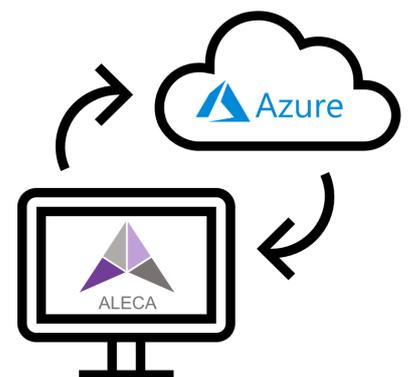
When you think of top oil & gas cities of the world, which have a wealth of global expertise, and have a track record for delivering complex international Upstream projects, Kuala Lumpur is within the top three along with Houston and London. ALECA Sdn Bhd is a technology startup based in Kuala Lumpur, which is leveraging that ecosystem to deliver a cloud-based system (SaaS) and a global consulting network. On October 8<sup>th</sup>, 2020, the company launched its product globally and is catapulting a traditional industry into the 4th Industrial Revolution.

Things have changed, it is time to do things differently. The team at ALECA have recognized this years ago and have brought to market a true Work From Home

(WFH), cloud-based toolkit that embraces Agile ways of working and collaboration. Built-in modules, like a mechanics toolkit, multi-disciplinary teams collaborating globally using ALECA can evaluate any Upstream Energy investment opportunity with confidence.

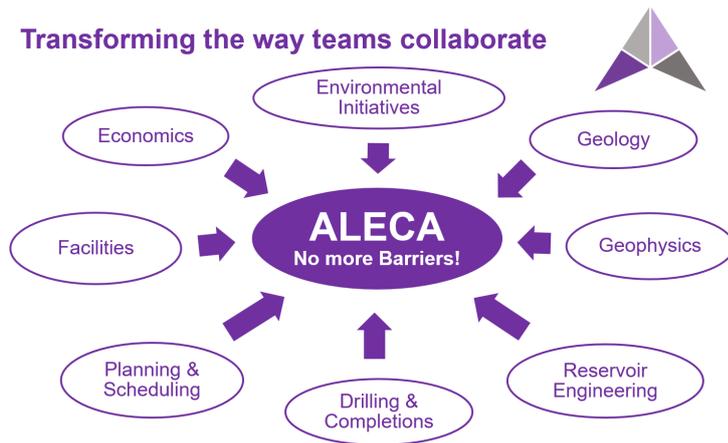
ALECA is developed by a dedicated multi-disciplinary team of international upstream energy consultants with over 100 years of project experience. The team, based in Kuala Lumpur has 5 nationalities, a full range of years in the industry, and supports Young Professionals and Women in Industry. So far, the software has 300 man-months of research and development, along with two years of programming. The system is also hosted

on Microsoft Azure and brings all the security that Microsoft provides. The company is poised for rapid growth and is developing more modules to replace other incumbent outdated and expensive industry packages.



*ALECA is hosted on Azure, a secure cloud service by Microsoft.*

## Transforming the way teams collaborate



*ALECA brings all disciplines onto one cloud-based system, breaking down barriers between professionals.*

What are the Upstream Energy industry's problems or pain points ALECA solves? Remote collaboration between experts for starters! Many companies cannot afford to have large teams of experts on staff full time, nor can organizations afford many different high-end software packages to study in detail every aspect of a project. Being a cloud-based Agile collaborative platform and the foundation for a global consulting network ALECA unites all experts from various disciplines via technical and commercial modules to collaborate seamlessly and remotely. The company is well-positioned to be an industry partner for years to come and could potentially become the new standard for how to evaluate an opportunity.

How is ALECA different from the competition? ALECA is the first cloud-based software to provide a full-spectrum, simplified toolbox of modules, from project management, geoscience, engineering, facility, and economics, to support Agile techno-commercial evaluations. Companies that use ALECA are reshaping their work methods to focus on value, reduce inefficiency, and reduce the risk of overcapitalization on investment projects. By tackling this inefficiency, we can introduce more innovative ways to help reduce carbon emissions, help keep our industry-relevant and do the right thing.

ALECA's mission is to provide a cloud-based, collaborative system and consulting solution that creates more efficient evaluation workflows allowing users to prioritize their work-life balance and implement environmental initiatives to their projects. Our vision is to be the trusted partner providing asset evaluation and collaboration solutions to the global upstream energy industry.

The team at ALECA believes that both their vision and mission can be delivered following core values that will enable us all to do the right thing. This may be to spend more time with our loved ones or pursue activities within our communities and at the same time, taking care of the planet to build a greener tomorrow. At ALECA, these things should not come at a great cost and personal sacrifice. As a startup, ALECA believes in work-life balance, and working on meaningful ways to improve the quality of life for all including the environment, through ingenuity, time efficiency, and collaboration. The team at ALECA is now inviting partners who share this vision, to join them on this journey.

One unique aspect of ALECA that the team is proud of is their carbon footprint calculator. ALECA provides a standardized way to calculate the carbon footprint of our projects and communicate

the environmental initiative's project teams have implemented to reduce carbon emissions for a greener world. Our energy investment proposals today are being held to higher social and environmental standards by all stakeholders and that trend will continue. At ALECA, a project team can calculate the carbon footprint of their produced hydrocarbons and estimate the footprint of their investments, along with estimating the value of implementing environmental initiatives. This important step in the ALECA Agile process will encourage innovation and is a great mechanism to bridge technical disciplines, decision-makers, and stakeholders.

Along with technical and commercial modules, ALECA has a series of project management tools, one of which encourages the population of a risk register. Building a risk register is a critical aspect of Agile iterative project delivery. It allows teams to openly capture ranges of uncertainty, quantifying and communicating Minimum - Most Likely - Maximum estimates for each discipline, even performing probabilistic assessments calculating the P10-P50-P90 values. This new way of working, in combination with iteratively performing an economic analysis throughout the life of a project while retaining ranges of technical uncertainties for each discipline, allows teams to focus their efforts and through collaboration, implement innovation.

ALECA helps teams focus on value and innovation through multi-disciplinary collaboration to mature commercially viable investment proposals. However, bridging the communication gap (..and even the generation gap!) between disciplines is a challenge. Traditionally, experts are reluctant to share uncertainties as they have not spent enough time conceptualizing its ranges. Contributing to this reluctance is traditional corporate internal processes, which at times forces experts to go through fixed stage gates,

often discipline-related such as geology, reservoir engineering, drilling, facilities & economics, where limited multi-disciplinary collaboration takes place. Within the traditional, comfortable bounds of their science, each expert tends to work in a silo without seeing the bigger picture nor identifying the investment risks early in a project. This clear disconnect between science and investment decisions decreases capital efficiency and increases the risk of not implementing the latest innovation, nor ensuring commercial success.

Traditional discipline-related investment decision Stage Gates, often called the “Waterfall” method, tend to have longer timelines, are perceived as less flexible, increase the number of handovers, and can magnify early errors later on, in the final decision. Repeating the complex workflows and returning through a previous gate is not an enjoyable experience in most organizations nor is it appreciated amongst team members. Only a new way of working, with new tools, can break the conventional thought process and view collaboration as an opportunity to increase efficiency to transform the way we evaluate energy assets. ALECA is designed to break this traditional way of working and bring Agile methods to the industry.

## CARBON FOOTPRINT CALCULATOR



*ALECA has a simplified way to calculate your project's carbon footprint for both the capital spend and the hydrocarbons produced.*

**Things have changed...  
...new ways of working are needed**

## Asset Life Evaluation & Collaboration App



**ALECA  
AGILE  
TRAINING**



Our courses raise the competency level of all professionals and gives them the tools to confidently collaborate between disciplines.



*ALECA also provides a series of training programmes for Young Professionals to evaluate the entire Upstream asset lifecycle.*

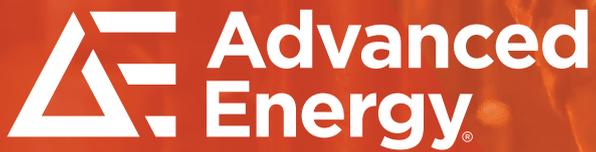
Learning from other industries, ALECA introduces Agile methods and tools that are faster paced, collaborative, iterative, and focus on value. This can be done by sharing the data and interpretations as soon as they are conceptualized amongst team members, reducing cycle times, simplifying solutions, and communicating the range of uncertainty that is traditionally hidden within our expert silos. ALECA facilitates this on a central, cloud-based platform, allowing entire project and investment teams to remotely collaborate at every stage of the evaluation. Working in this Agile manner promotes an open culture and communication within organizations, facilitating faster, better informed decisions, enabling teams to focus on both the value and the science.

With collaboration, Agile ways of working and simplified software solutions, ALECA delivers a system that engages and inspires Young Professionals (YPs) in the energy industry. Attracting, training, and retaining top talent is a challenge for any industry. ALECA Sdn Bhd has positioned itself to provide a modern toolkit & training program that YPs can use to be part of the conversation on the

environment, on complex projects and innovation. Companies working with ALECA are provided with a structured long-term training program that builds a YP's competence and confidence. The system also leverages more experienced professionals globally, giving rise to additional mentoring opportunities within projects. An outcome for many companies who use ALECA is a successful succession plan of competent YPs, to replace an aging workforce.

ALECA unites all professionals, young and old, onto one, secure cloud-based system and empowers teams to seamlessly leverage a network of global experts remotely. Through this collaboration, there is no limit to what innovation your teams can implement! Contact us today to become our industry partner and transform the way you deliver projects!

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# Improve energy use. Reduce maintenance costs. Boost product quality.

Gain actionable insights using precision non-contact temperature measurement and electric heat control to help meet your digital enterprise goals quickly and efficiently.





# ADVANCED ENERGY INTRODUCES INNOVATIVE NEW PYROMETRY PLATFORM FOR PRODUCTION MONITORING

Impac Series 600 can be used in power control and optimization of industrial heating applications to meet the challenges of Industry 4.0

DENVER, Colo., October 27, 2020

— Advanced Energy

(Nasdaq: AEIS) – a global leader in highly engineered, precision power conversion, measurement and control solutions – today announced the release of its new pyrometry platform, the Impac<sup>®</sup> Series 600, for non-contact temperature measurement of non-metallic or coated metallic surfaces in industrial manufacturing applications.

Featuring a modular, field-configurable multichannel plug-and-play design, the Impac Series 600 is Advanced Energy's newest pyrometry platform. The multi-sensor head design, which interfaces with a central hub, enables cost-effective temperature measurement of up to eight points and can be used in power control and optimization of industrial heating applications. The Impac Series 600 is user-friendly and provides the flexibility to support applications in a wide variety of target markets, including automotive, laminating, injection molding, PET



bottle production, packaging and more. Its modular capabilities enable the addition or replacement of temperature measurement points without the need to return the system to the factory for calibration, reducing downtime and overall cost of ownership.

“The Series 600’s highly configurable digital architecture and ability to interface with a variety of customer protocols delivers on the Industry 4.0 promise of real-time data analysis and improved process

control for uniformity and repeatability. It also means higher equipment uptime through predictive maintenance,” said Jeff Hebb, vice president, product marketing, photonics and power control solutions group at Advanced Energy. “Building on Advanced Energy’s industry-leading Impac pyrometers, we are lowering the barrier to implementing highly accurate, multipoint temperature monitoring and control. Our goal is to offer customers architecture that is flexible and easy to install and maintain, while also providing



an attractive cost of ownership. With the new Series 600 platform, we are planning further expansion to additional temperature and wavelength ranges for a growing number of industrial applications.”

The Impac Series 600 includes the following features:

- Supports 1-8 measurement points, making it one of the most adaptable options on the market today
- Field configurable and highly flexible plug-and-play functionality
- Field-replaceable sensor heads without the need for factory recalibration
- Analog and digital outputs, with and without display screen

- Intended for power control and optimization of industrial heating applications in automotive, laminating, injection molding, PET bottle production, packaging and other industrial markets

### About Advanced Energy

Advanced Energy (Nasdaq: AEIS) is a global leader in the design and manufacturing of highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes. AE’s power solutions enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing and healthcare. With engineering know-how and responsive service and support around the globe, the

company builds collaborative partnerships to meet technology advances, propel growth for its customers and innovate the future of power. Advanced Energy has devoted more than three decades to perfecting power for its global customers and is headquartered in Denver, Colorado, USA. For more information, visit [www.advancedenergy.com](http://www.advancedenergy.com).

**Advanced Energy | Precision. Power. Performance.**

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+1 949.306.0276



# OnRobot Launches Out-of-the-Box Robotic Sanding Tool for Cost-Efficient Finishing Applications

OnRobot Sander is the latest addition to OnRobot's growing range of no-fuss, application-centred automation solutions.

Sander is lightweight [1.2 kg], with operating costs just 5% of pneumatic sanding systems

Singapore, September 17, 2020: OnRobot has launched OnRobot Sander, an all-electric random orbital sander for automated finishing applications, including sanding and polishing.

Traditional sanding automation solutions often require a background in robotics to implement and maintain. With the launch of OnRobot Sander, manufacturers now have access to a complete out-of-the-box sanding tool that's easy to use with all major collaborative and lightweight industrial robots.

The complete Sander package incorporates everything OnRobot

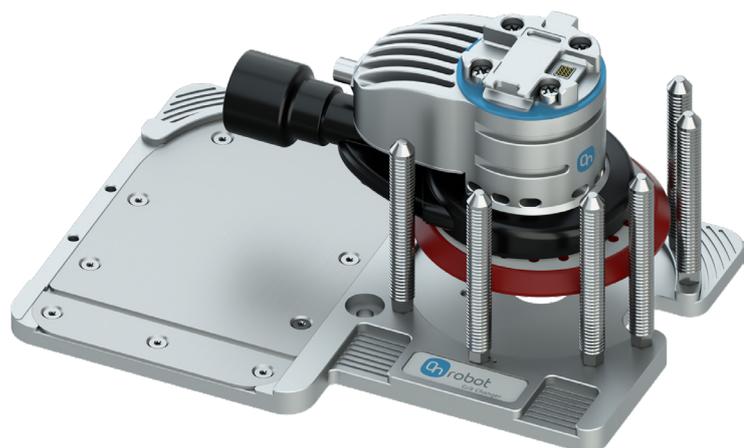
customers need to get their sanding application started quickly and easily: a plug-and-play sanding tool, a variety of standard sanding and polishing pads, easy-to-use programming software, an optional force/ torque sensor and a Grit Changer that enables automated switching between different sanding grits without operator intervention.

## Taking usability a step further ●

Programming simple surface finishing applications on Sander is easy thanks to the intuitive built-in software. But OnRobot

takes usability a step further with the addition of a "Save Position" button on the tool that allows users to set waypoints manually without using the robot's teach pendant. The Sander software comes with different path planning options - handguide, shape and points, and allows users to adjust rotation speed, optimising cycle time and consistency.

"OnRobot is committed to providing small and medium-size businesses with affordable, application-centered solutions that are easy to set up and maintain.



OnRobot Sander is a versatile sanding tool that provides all the features and benefits our customers expect of automated sanding technology, but without all the hassle and cost traditionally associated with automated sanding tools,” says Enrico Krog Iversen, CEO of OnRobot.



OnRobot Sander supports flat, curved and uneven part geometries and comes with replaceable standard pads that can be used on a wide range of materials. Adding a force / torque sensor enables the sander to adapt to surface variations or part misalignment, while improving consistency and quality and reducing scrap rate. All of the advanced features of the OnRobot Sander are supported on Universal Robots cobots, but the tool is easily integrated with any major robot brand.

### Significant cost savings compared to pneumatic sanders ●

Sander is a lightweight [1.2 kg (2.64lb), with pad] solution that combines the power of its brushless electric motor power (up to 10,000 RPM) with operating costs as little as 5% of that of pneumatic sanding systems. Traditional pneumatic sanding machines use external air compressors, which are very expensive and prone to leaks. Meanwhile, Sander’s brushless electric motor is durable and reliable with a lifespan equal to or greater than that of competing pneumatic systems.



“OnRobot is committed to democratising automation, product by product and application by application, by making ready-to-go solutions available to companies that are completely new to automation. We take the cost and complexity associated with automation away, leaving our customers with the all-important functionality they need to get the work done,” explains Iversen.

### Sander provides safer work environment ●

Sanding is often dirty and dangerous work that carries a range of potential health risks for workers, from the debilitating ‘white-finger syndrome’ caused by high vibration hand tools to lung damage caused by particulate matter. OnRobot Sander eliminates these risks and uses 3M clean sandpaper discs, which allow more dust to be extracted, thereby ensuring a safer environment for workers compared to competing systems.

“At OnRobot we’re seeing increased interest from companies that are completely new to robotics but are looking for ways to supplement existing labour through automation. These companies are looking for simple, user-friendly solutions, like OnRobot Sander, that can be easily deployed on a wide variety of tasks within each application domain,” says the OnRobot CEO.

### Robotic Finishing Market to Grow Across Asia ●

In 2016, the global robotic cutting, deburring and finishing (CDF) market was valued at about USD500 million. This is expected to reach USD1.3 billion

by 2024, with CDF robots predicted to grow at a CAGR of 20 percent between 2017 and 2024, accounting for more than 50,000 units.

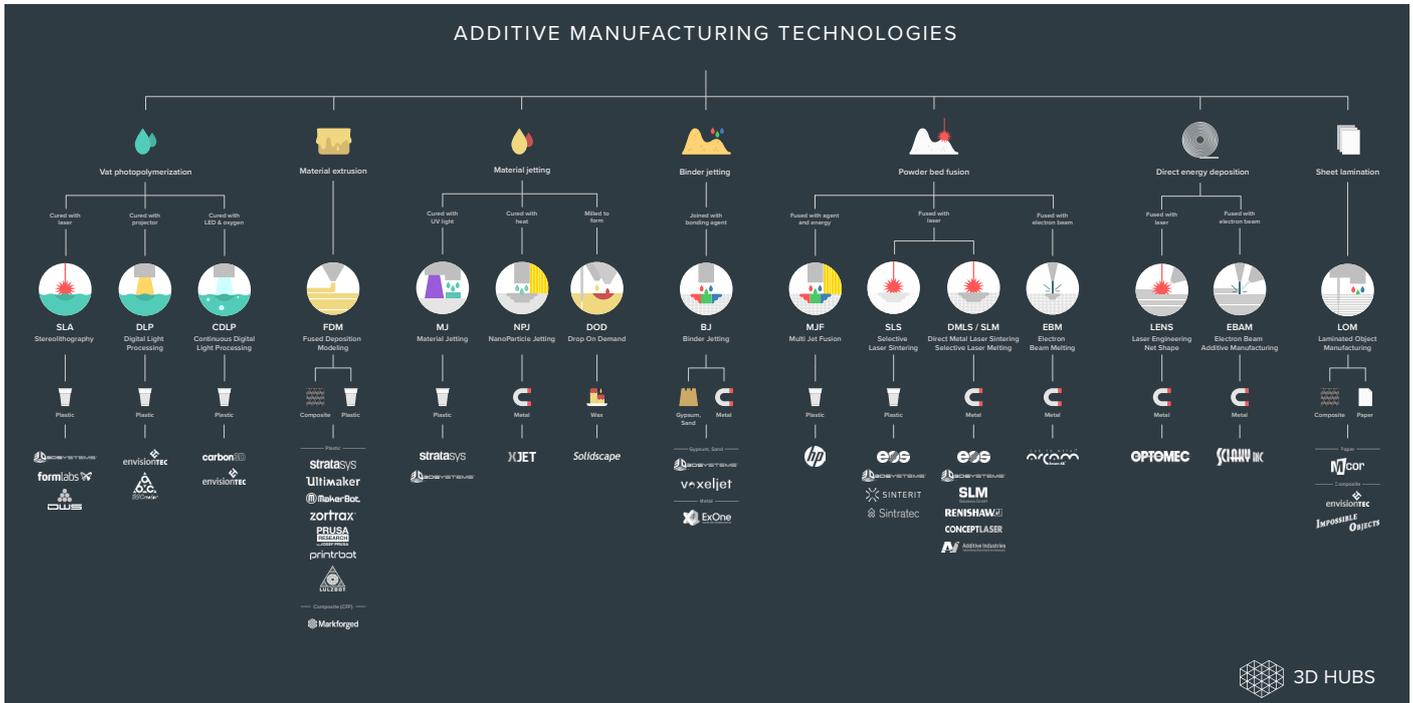
Asia sees high demand, with CDF applications in various industries such as automotive, metals, electronics, chemicals, plastics, furniture and wood. Rising need for precision, quality output and speedier production is expected to increase the region’s adoption rate.

James Taylor, General Manager, APAC at OnRobot, said: “The OnRobot Sander furthers our drive for continuous innovation, expanding the possibility of robotic automation. It also cements our commitment to help local manufacturers embrace robotic automation easily, while enjoying quicker returns through our growing range of no-fuss, application-centred automation solutions”.

### About OnRobot ●

OnRobot product range features a wide assortment of tools for collaborative applications, including electric grippers, force/torque sensors, a vacuum gripper, the award-winning Gecko gripping technology, and tool changers. This new combination of offerings from OnRobot makes it quicker and simpler to automate tasks such as packaging, quality control, materials handling, machine tending, packaging, assembly, and surface finishing. Headquartered in Odense, Denmark, OnRobot also has offices in Los Angeles, Dallas, Soest (Germany), Barcelona, Warsaw, Shanghai, Tokyo, Seoul, Singapore and Budapest. For more information, visit [www.onrobot.com](http://www.onrobot.com)

# Reality and Scalability of 3D Printing for Industrial Spare Parts



[Picture source: 3D Hubs (<https://www.3dhubs.com>)]

Approximately more than 30 years ago when additive manufacturing (or 3D printing) was in its inception phase which then used to be purely a rapid prototyping technology mainly used by industrial companies to get a quick visual and feel of their design in the product development stage consisting of a few iterations before going into production mode. Additive manufacturing then, was a very expensive equipment and investment due to the novelty during that time however, over the past few years the technology has advanced and grown into a market size which achieved USD5.1 billion in the year 2015 with a CAGR of 30% over the last four years [1].

In contrast to traditional manufacturing processes which are subtractive (as opposed to additive), additive manufacturing allows for creating end parts by building them in a layer by layer fashion hence the name “additive

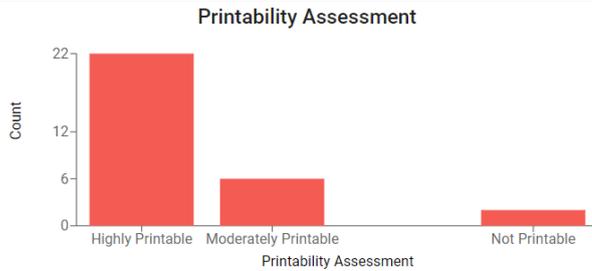
manufacturing”. There are multiple benefits coming from this technology mainly aimed towards a cleaner and greener approach such as a lower carbon footprint and more economical due to the nature of process which does not remove material as waste (up to 60-80% waste material for traditional manufacturing processes) but instead layering material one-by-one until the end part is produced. In addition to that, additive manufacturing allows for design freedom for end parts as it does not require a tool to process the raw material which means that designs having undercuts, internal structures such as lattice and hollow, complex features and intricacies can still be produced using additive manufacturing.

There are currently six of the most commonly used technologies today grouped into families which are (1) vat photopolymerization or more commonly known as resin-based 3D printing (2) material extrusion or fused deposition

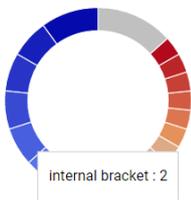
modelling using filaments, (3) material jetting, (4) binder jetting, (5) powder bed fusion and (6) direct energy deposition.

In recent years, we have seen additive manufacturing grown into a very notable and significant sector in manufacturing for rapid prototyping and at times could be used and qualified for end-use parts and components wherein the application fits. There has been huge developments in additive manufacturing materials by large chemical companies such as BASF, Arkema, Dow Chemical Company and more to develop advanced materials for niche and special applications and use. We have seen a multitude of different materials and processes available commercially today which can fit different environments of use but the real question is:

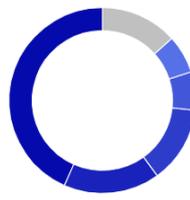
**How do we scale from here?  
How do we identify more parts to be 3D printed?**



Part Categories



Equipment



[Picture source: Spare Parts 3D]

Companies especially large organizations today are investing a lot in manpower to manually select best candidates for 3D printing by doing their own analysis on the part individually which consumes a lot of time and no sense of scalability.

In recent weeks, we have been working with one of the world’s largest petrochemical company in Latin America, Braskem to help optimize their inventory supply chain in a way that will make it resilient and fully digitalized to account for obsolete parts, high MOQ issues and lead time reduction in supply of spare parts by using 3D printing. Braskem aims to leverage the 3D printing technology to manage their supply of emergency parts, and to reduce its expenditure on holding heavy amounts of stock and inventory.

This case study entails Spare Parts 3D’s initiative in a pilot project with Braskem to assess 15,000 components in their ERP to identify parts which are suitable to be industrialized to 3D printing, basically a conversion from production of parts using conventional methods (CNC machining, casting, forging, etc.) to production of parts using 3D printing technologies.

By using Spare Parts 3D’s software, DigiPART™ which is built around a three-phase approach, a total of 7,950 components and parts (53% of 15,000)

were identified to be suitable candidates in being produced using 3D printing. The three-phase approach begins with the software being fed a subset of data including information such as “part name”, “material”, “MOQ”, “purchasing cost” and more (basically technical and financial information of purchasing data is extracted from the ERP system). From this data, the software maps out and identifies candidates which are suited for 3D printing by implementing core IP algorithms to filter them based on

commercial 3D printing materials, build sizes, technical information all which are gathered and consolidated within Spare Parts 3D’s DigiPART™ environment.

Once the first phase is carried out, the software moves onto the second phase which then recommends suitable and optimal materials and technologies to produce the components with by matching the data from the ERP to the software environment in which then spits out a visualization of the printability assessment of the results.

Thereafter, parts which have been identified and stored as a digital inventory in Spare Parts 3D’s DigiPART™ can be ordered on-demand leveraging on the company’s qualified network of 3D printing suppliers around the globe. Hence, the third and final phase where an on-demand production approach by using 3D printing can be utilized by companies to start ordering parts to be delivered to their specified location and with specifications as per outlined and recommended by the software.

**EXECUTIVE SUMMARY**   META DATA   FILES   3D ANALYSIS   SPECIFICATIONS   TECHNOLOGY TRANSFER

Fields marked with \* are mandatory

**Part Information:**

Catalogue: Home Appliances

Name \*: CAP SHLD FRT #605      Part Number \*: SP3038599

Manufacturer: SP3D      Manufacturer Part Number

**Part Type:**

Industry: Home Appliances      Equipment: refrigerator      Part Category: shelf braket

Description:

Material: ABS  
Colour: 12H2427 60% gloss  
Tests: Heat + Distortion, Taste and Odor, Surface rendering

**Technical Card**

Material: HP 3D High Reusability PA 11

Process: Powder Bed Fusion (PBF - Plastic)

Post Processes: Spray painting, Paper sanding

**Business Card**

3D Printing Price: 11.25 USD

Post Process: Upon request for quote. USD

More Details

APPLY   GO BACK      PROCESS ORDER

[Picture source: Spare Parts 3D]



The following steps in collaboration with them is for the Braskem industrial team to begin selecting parts which they are in current need in replacement and procuring them through Spare Parts 3D's DigiPART™ online platform. In accordance with this success with Braskem, Spare Parts 3D has also been recognized and showcased in several global media companies on scaling 3D printing for industrial spare parts.

In other instances with one of Spare Parts 3D's key account in Europe, once components were scoped out by the software, the company planned to try out their first ordered component on-demand and they selected two potential candidates from those identified by the software. The first part was a turbine blade in which the MOQ was 10 units however their annual consumption of this sort of part is only one (1) part per year. Producing the part with 3D printing (SLM powder bed fusion 3D printing technology) costed USD1,236, plus a one-time reverse engineering service of USD990, as compared to USD1,050 for conventional manufacturing. By producing only the single unit they required for the year, we were able to help our European

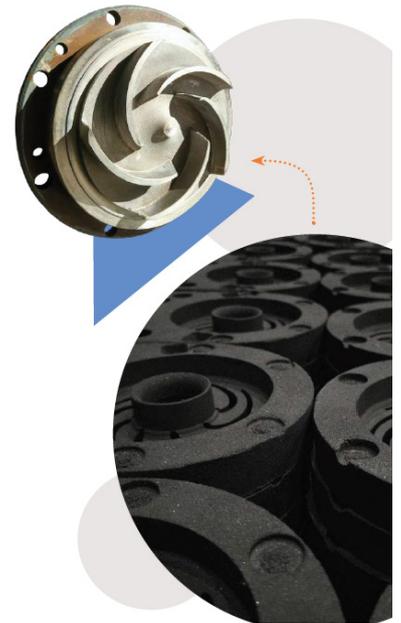
client reduce their cash spend in the first year by USD7,780. Over 10 years — taking into account industry-standard inventory carrying costs of 20% per annum — the customer saved USD667 per part which is roughly 60% savings!

The second component that was chosen by our European key customer was a pump impeller. The interesting fact about this impeller was that it was only available from the original equipment manufacturer (OEM) with a lead time of 4 months and at a cost of USD23,000 per unit. As this part was at the time urgent for the customer, this pump impeller was scanned and remodelled into a 3D CAD file to re-create the part. With 3D printing, the mold was 3D printed using sand material and used to cast the part using stainless steel 316 (SS316L) material in just three (3) weeks at a cost of USD5,000. This technology (known as rapid casting) was 78% cheaper than the conventional method of manufacturing and was 20% faster in terms of lead time.

These parts have undergone the relevant testing requirements and validation on customer side and are being industrialized to be used in the actual environment

as a spare part. We see 3D printing as a tremendous game changer for the manufacturing industry whether in R&D or production environments but one thing is for sure, 3D printing your spare parts will be able to help reduce your inventory holding costs and supply parts much faster to your customers which will benefit the organization in the long run in addition to having customer satisfaction at the highest (if you are an OEM).

To reiterate the aforementioned above, we need forward lookers in this growing industry to start exploring and implementing innovative ways such as 3D printing to reduce costs associated with their business as the hot topic around the globe currently is all about cost reduction and cost-effectiveness.



We believe that we play an integral role in assisting companies scale their usage of 3D printing for those who have already started using the technology and to help those which are not, explore the vast range of capabilities and benefits that 3D printing can bring to their business. The time is now.

*Benjamin NG  
Regional Business Development Manager  
(APAC)  
Spare Parts 3D*

# MAKE YOUR SPARE PARTS INVENTORY 3D-READY WITH SPARE PARTS 3D

Reclaim control of your supply chain  
by printing on demand

**It's a simple three-step process:  
Identify, Digitize, Print.**



1



2



3

**Identify** your spare parts efficiently.

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## CONTACT

**Benjamin NG**  
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spare-parts-3d.com



# What is Time Sensitive Networking?

Ethernet has been serving network operators well for nearly three decades, and while it has certainly developed a great deal over the years, its most “revolutionary” jump is emerging right this minute. The new technology enhancement is called “Time-Sensitive Networking (TSN).”

Its strong value-adding functions have been proven very successful in testbed and demo networks and real-world network

operators can begin benefiting from the technology right away. Many societies and organizations in automation and mission-critical communication have begun their transition to TSN-based Ethernet (e.g. the Profibus Nutzerorganisation).

I like to think of Time Sensitive Networking as “Ethernet Plus” because it is not so much a “brand new” protocol as it is an enhancement to Ethernet. TSN stands on the shoulders of something very

effective and successful and makes it even more so.

**Time Sensitive Networking allows users the following:**

- Combine disparate networks in one
- Delivery guarantees
- Full interoperability



A key value-add that TSN brings to industrial applications is the ability to drive unification of networks that were, out of necessity, separate in the past, so users can enjoy cost savings as well as performance improvements. TSN is capable of distinguishing traffic, assigning individual packets with different priorities, and sending each stream over the network while observing their timing constraints. So, for example, you can have critical traffic like motion control that has precise real-time demands and traffic such as bandwidth-consuming file transfers without real-time demands running simultaneously on the same network at the same time without interfering with each other. Different applications, different

priorities, same time, same network and all with timely delivery guarantees as needed. That's the TSN (r)evolution.

And there's more. Users of Ethernet systems with vendor-specific real-time extensions have long been displeased about the necessity of being locked into proprietary equipment fleets over the long term since products and protocol extensions are not interoperable. With TSN, that challenge will become a thing of the past. TSN is vendor agnostic, with full interoperability amongst components. I've seen that most major vendors of automation equipment are adopting the standard fully and will be migrating away from proprietary Ethernet solutions. The vendors have come together under the umbrella of the OPC Foundation and are working together in the Field Communication Initiative (FCI) to create one automation Ethernet technology that ensures full interoperability.

### Upgrade with Time Sensitive Networking

Without being burdened with the responsibility of choosing a single vendor that one would have to commit to "forever," network operators don't have to play a waiting game to see which vendors are offering what. They can start slow with TSN and build. In fact, in many ways, TSN is designed to do just that. I look at it as a group of standards, a collection of puzzle pieces that you can join together in different configurations, adding good capability enhancements now and adding more pieces later for even greater capability enhancements over time.

Moreover, TSN is well-suited to a "brownfield" approach. That is, you don't even have to start with a new network you can readily layer capabilities on to your existing Ethernet networks simply by adding on or replacing switches and updating firmware. TSN is flexible and customizable to your needs.

### Time Sensitive Networking experts in your corner

With all TSN vendors following the same standards and being interoperable in communication, differentiation between the providers will be present in different relative levels of quality, performance, and usability. Belden is one of the first out of the gate with true TSN-ready products, such as Hirschmann Industrial Ethernet Switches. They distinguish themselves, I believe, for the flexibility of their configurability as well as the fact that the instrumentation is extremely precise (down to the microsecond level) and the time synchronization capabilities are excellent. These latter two characteristics are perhaps especially noteworthy being that the Ethernet enhancements are called "Time-Sensitive Networking."

Belden representatives have been involved with the TSN standard since its original conception way back in 2010 and even before that in early discussions. At that time it was known as "Audio Video Bridging Generation 2." Once it was identified as a starting point for a major evolution for Ethernet in industrial automation networks, Belden worked with several key industry partners to help pack more and more capability into the flexible standards. To codify some of our learnings for even the most inexperienced, Belden has developed a TSN white paper.

Download a free copy via the link <https://tinyurl.com/BeldenTSN> or scan the QR code below.



Article written by Dr. Oliver Kleineberg from Belden

# Are Industrial Robots the Missing Piece to Your Industry 4.0 Puzzle?



In 2013, the German government unveiled its Industry 4.0 strategy and kicked off a global race toward a new era of digitalization and smart manufacturing. Yet this year's COVID-19 pandemic outbreak is forcing enterprises to adjust production policies and relocate factories implementing the technologies of automation, standardization, intellectualization, and digitization for decentralized manufacturing and logistics, and import/export cost reduction.

In this landscape of industrial transformation, flexibility is a primary goal for manufacturers, and the demand for industrial robots is rising. Peter Peng, Director of Delta's Robotics Automation comments, "We've seen the robotics market grow since 2012 and peak in 2017, with shipment growth rate at 40%. Although external factors impacted the market and slowed growth from 2018 to 2019, we're optimistic about a new growth wave after 2020. We estimate the robotics market to have a CAGR of about 9.1% from 2017 to 2023. So if smart manufacturing transformation continues, robots will be present in more industries."

Taiwan's crucial role in the machine tool industry has led to the integration of machine tools with Japanese robot arms. However, now domestic six-axis and collaborative robots are available to better satisfy local manufacturers and spur the domestic robot market. To improve the price-performance ratio and system efficiency, domestic manufacturers need to simplify operations and integrate robots with even more applications.

As manufacturing changes, market demands for automation have turned from dedicated equipment to highly flexible smart equipment with robots considered an important piece of the Industry 4.0 puzzle. At Delta, we've devoted ourselves to automated production for over 20 years, and we now enter our fifth year in the robotics market since the debut of our first SCARA robot in 2015.

Peter Peng points out, "Delta's competitive advantage is that we have the electronics processing technology and years of experience in developing automated key components for integration with robotic solutions. We can learn and improve

from actual tests and production with our own components and production lines. By going through the user experience ourselves, we can verify every product and fix weaknesses before launching to the market. We especially use this experience in our expansion into the automotive and electronics industries."

Meanwhile, traditional industries like packaging, food, and pharmaceuticals are also adopting robots to boost their production. To cater to this, Delta developed Selective Compliance Assembly Robot Arms (SCARAs) and six-axis articulated robots that suit various industries with dedicated functions including conveyor tracking and inspection on the fly for easy operation.

We've found that some customers new to automation are somewhat hesitant to utilize robots due to difficult programming languages and operation. That's why we continue to improve our solutions by working alongside our customers and learning from their feedback. For example, Delta recently launched a powerful and user-friendly robot simulation software called DRASimuCAD which integrated CAD, CAM and robot simulation programs for smart manufacturing.

To learn more about Delta's robot solutions click here:

<https://www.deltaww.com/Products/CategoryListT1.aspx?CID=06&hl=en-US>

Contact us at:

Delta Electronics Int'l (Singapore) Pte Ltd

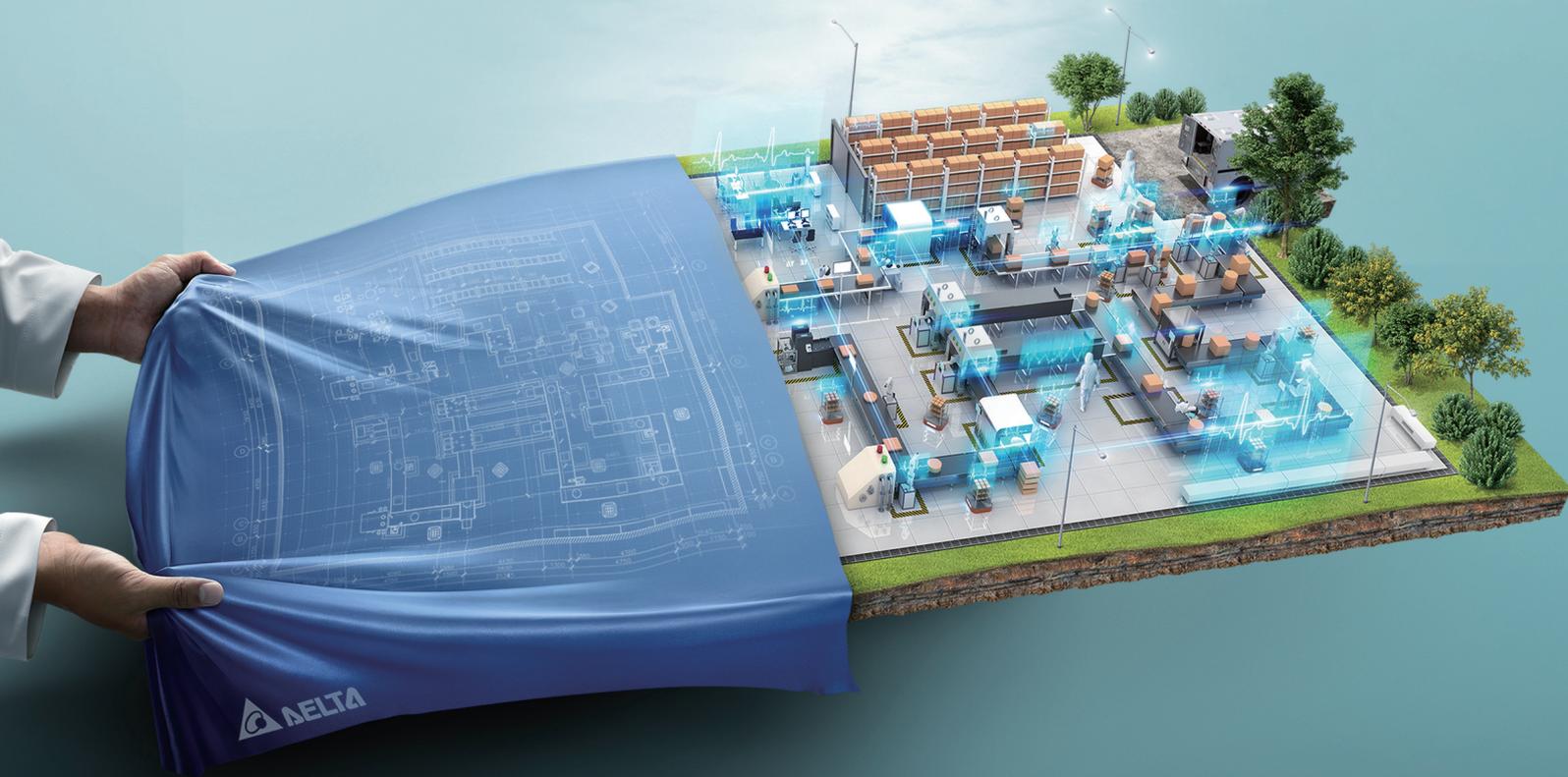
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# Ultrasonic Detection of Gas Leaks in Ammonia Plant Extends Safety Profile for Major Fertilizer Manufacturer

## SUMMARY

Ultrasonic Gas Leak Detector is an advanced system that uses four ultra-sensitive acoustic sensors that constantly monitor wide areas for ultrasound generated from the release of pressurized gas. In the event that a leak is detected, it will generate an ultrasonic noise which gave the company a high level of safety assurance.

## RESULTS

- Early warning safety solution for potential gas leaks
- Increased safety for personnel and property
- Reduced need for dangerous, high tank maintenance
- Factory calibration for life eliminates up to 64 hours of maintenance time per year per unit, a cost estimated at \$50,000 for 10 units

## APPLICATION

Fertilizer production with urea and ammonia plant.

## CUSTOMER

A major international fertilizer production facility in the Asia Pacific.

## CHALLENGE

A world-class fertilizer manufacturer in the Asia Pacific employs closed manufacturing processes, using natural gas and fresh air as input materials and producing urea and ammonia as output products. The plant has its power supply

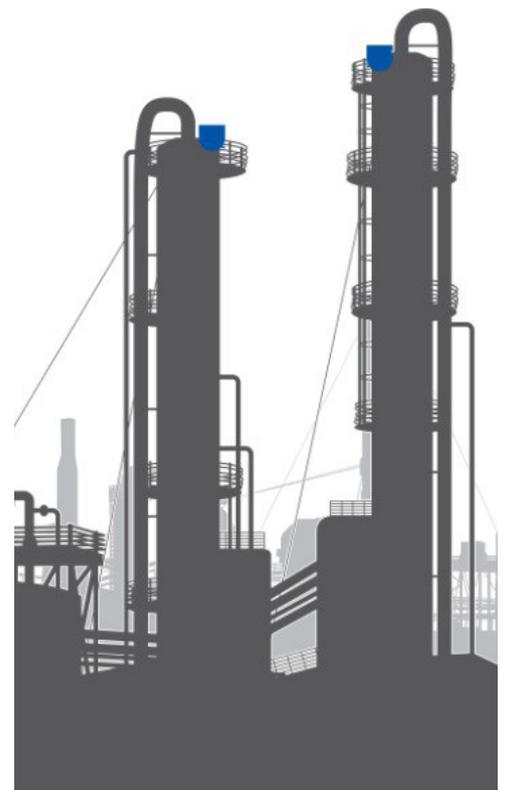


**Ultrasonic gas leak detection improves safety for a fertilizer manufacturer in its challenging urea production environment.**

unit, which makes the plant's operation uninterrupted and independent from the national power network supply. The plant has four main units: ammonia unit, urea unit, utility unit, and product unit, among other functional units. The engineering staff runs the plant safely and efficiently, and the plant reached 10 million tons of urea production in July 2017.

Like most plants in its industry, this facility had basic fire and gas detection capabilities; however, there were vulnerabilities. The process produces a large number of light gases in the process flow such as hydrogen, carbon monoxide, and carbon dioxide, all of which tend to rise and disperse quickly. Therefore, the application of point gas detection is typically not very useful because of the relatively slow response time of traditional gas detectors. Hydrogen gas, in particular, is highly flammable and will burn in air at a very wide range of concentrations between 4 percent and 75 percent by

volume. If a small leak of hydrogen occurred in the pipe at high temperature, it could cause a flame.



In the area unit, the facility had a 40-meter tank containing hydrogen. Due to the flange connection of the tank, there was a risk of leakage, which traditional point gas detectors that rely on zone coverage could not adequately detect. Maintenance personnel was required to climb the tank to check on its integrity every two to three days, a process requiring a 30-minute climb each way, incurring huge operational costs to the plant.

## OIL & GAS

The company was beginning a search for an improved gas detection method when they experienced a small hydrogen fire from a leak in the pipeline in the urea unit. The mishap spurred immediate investigation of a better way to provide early warning of gas leaks in these challenging locations.

## SOLUTION

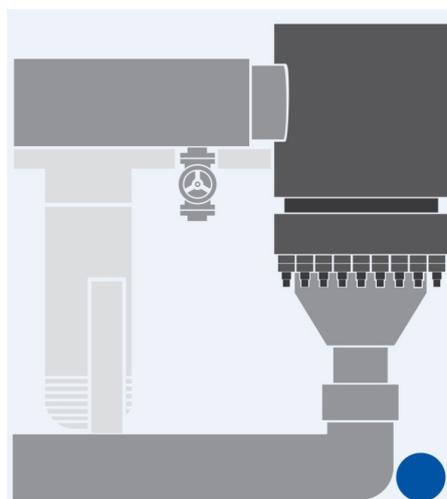
Emerson experts had advised the company that the Incus ultrasonic gas leak detection system could be used to provide early detection of gas leaks under pressure. When the fertilizer company investigated further, it learned that ultrasonic gas leak detection could be used in its application because the high-pressure gases and leak size would cause an ultrasonic noise. The ultrasonic noise makes it detectable by the Incus, which “hears” the leak in the ultrasonic range rather than perceiving a gas cloud, such as is done by traditional gas detection systems. The ultrasonic gas leak detector gave the company a high level of safety assurance. Because of its failsafe operation, it is always listening, even during self-test mode, with no dead periods for unrevealed failures. It was also estimated that the coverage radius of the ultrasonic detector would be within 10 meters, which was appropriate for the installation requirements. The best approach for calculating coverage area is to work from the maximum and

minimum hole sizes for a leak that can be detected. From this information, the leak rate can be calculated and a coverage radius provided.

In addition to the coverage area and ultrasonic detection, the Incus is also a highly rugged device as required in this application. It is not affected by water due to its piezo-ceramic sensor, is highly stable, and is made of corrosion-resistant stainless steel that resists the ambient air in a urea plant, which is very corrosive. The rugged design of the Incus eliminates the need for regular spare replacements and is estimated to decrease maintenance requirements by 70 percent over traditional safety detection devices. Besides, because the Incus is factory calibrated for life, it eliminates up to 64 man-hours per year customarily required for on-site calibration of each unit, a function that is often performed in dangerous or challenging environments.

## RESOURCES

Incus Ultrasonic Gas Leak Detector  
[Emerson.com/Incus](https://www.emerson.com/Incus)



*The blue circle represents suggested Incus placement beside the pillar at 2.5 meters above ground level. The pillar is used to block the high noise coming from the hydrogen generator plant.*



Incus Ultrasonic Gas Leak Detector



Tan Shing Yenn

Product Leader for Analytical Gas Analysis and Flame & Gas Detection  
 Emerson Automation Solutions, Asia Pacific

-  [Linkedin.com/company/Emerson-Automation-Solutions](https://www.linkedin.com/company/Emerson-Automation-Solutions)
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Life Is On

Schneider  
Electric

# Schneider Electric: The Powerhouse for IoT



**Astri Ramayanti Dharmawan**  
Country General Manager of  
Schneider Electric Malaysia

Astri Ramayanti Dharmawan is the Country General Manager of Schneider Electric Malaysia, who is responsible to support the company's growth both in Malaysia and Brunei. She is leading the team to better manage and integrate their energy distribution and automation processes in ways that make energy safe, reliable, efficient, and sustainable.

Prior to joining Schneider Electric Malaysia, Astri Ramayanti was the Vice President for Secure Power Business, Indonesia, Malaysia, and Brunei in Schneider Electric. She managed the entire Secure Power Business that Schneider Electric is involved in, including solutions and products for data center physical

infrastructures such as power & cooling, software, IT consulting services, and services.

Astri is also driving forth Schneider Electric's commitment to Innovation, Diversity, and Sustainability. She firmly believes that the company's achievements in driving diversity and inclusion through equal opportunities to its employees and staff is a key attribute in driving innovation and high performance in the company.

Graduated from Universitas Indonesia, Astri holds a Bachelor's degree in Metallurgical Engineering and a Master of Business Administration (MBA).



*Astri Ramayanti, Country General Manager of Schneider Electric Malaysia at the Schneider Electric Innovation Day: EcoStructure Plant & Machine 2019 celebrating Modicon M580 50 years in history*

**1. Schneider Electric's main business focuses on software, critical power, and smart grid applications. What is Schneider's forte compare to similar market players?**

At Schneider Electric, we empower all to make the most of their energy and resources, bridging progress, and sustainability for all. Our mission is to be our customers' digital partner for sustainability and efficiency.

We drive digital transformation by integrating world-leading processes and energy technologies, end-point to cloud connecting products, controls, software, and services, across the entire lifecycle, enabling integrated company management, for homes, buildings, data centers, infrastructure, and industries. We are the most local of global companies.



*Schneider Electric factory in Batam has comprehensively deployed a wide range of Industrial Internet of Things (IIoT) technologies including smart sensors, alarm prediction management and augmented reality to create an empowered workforce.*

We are advocates of open standards and partnership ecosystems that are passionate about our shared values: meaningful, inclusive, and empowered.

The systems we offer are Internet of Things (IoT) enabled, open, and intra interoperable and are designed to help achieve efficiency. We are highly committed to innovation such that a fraction of our revenue goes to research and development every year. We have a strong global ecosystem with a local presence around the world and a strong network of partners and system integrators.

50% of our global revenue in 2019 comes from digitalization where we provide both hardware and software required such as connected products, edge controls, analytics, software, services, Artificial Intelligence (AI), and more.

## **2. Based on your view, how can tech leaders in Southeast Asia execute the use of the Internet of Things (IoT) to address the industries' dire needs and solve the problems in this current pandemic?**

From our observation, companies have accelerated their digitalization strategy in the last 10 months as compared to

before where it will take up to a few years. The digital age has redefined the way companies operate and do business. Nowadays, you can see businesses pivot and leverage e-commerce platforms and virtual events to remain relevant to their audience and retain their competitive edge.

With the on-going pandemic, we know our customers are increasingly seeking solutions that enable them to perform remote monitoring, real-time collaboration, and predictive technology to increase efficiency and ultimately ensure business continuity.

On the industrial end, Schneider Electric is bringing together leading IT and Operational Technology (OT) manufacturers, industrial system integrators, and IT solution providers to build integrated solutions. The convergence of IT and OT requires instrumenting machines and integrating operational, production, and supply chain systems to bring more intelligence to the entire environment.

For example, all machines in an industrial or manufacturing facility that generates data need to be controlled and managed effectively so that it brings value to the operations. The process

starts when sensors collect data from the environment. They feed data into the OT system that then digitizes them. These digitized data then crossed over to the IT side for processing before they head to the data centers. This is where Edge Computing, which performs more analysis, comes into play. With Edge Computing, industrial players essentially get more from Industrial IoT – speedier insights that enable them to make critical decisions promptly to solve issues or capture business opportunities.

## **3. IoT has aided the healthcare system during the peak of the COVID-19 outbreak. How does the application of IoT drive the economy and various industries to the next level of digital transformations?**

It is important to reiterate the fact that digital transformation was taking place all around the world before COVID-19. What happened was simply a turbo-charged acceleration of adoption during the pandemic. The healthcare sector is one of them which experienced this. According to a recent survey carried out by Tech Research Asia (TRA) commissioned by Schneider Electric, 48% of Asia Pacific healthcare organizations have adopted Edge Computing. This statistic proves that a healthy number of healthcare organizations are headed to what we are calling “the next level of digital transformation”.

Today, given the impact on the economy and especially across Asia, digitalization can provide much-needed relief to businesses, helping them maximize operational efficiency, gain market share, and manage processes remotely.

With the application of IoT, businesses will be prepared to meet the demands resulting from the pandemic. For instance, previously if a facilities manager heard

that a compressor did not sound quite right, he would go physically to check various dials and gauges to troubleshoot the problem. We can digitize that now and use IoT to visualize those parts with optical cameras, microphones, vibration sensors, all sorts of devices that can save us footsteps. The digital tools also provide analytics that enables a far more proactive approach to maintenance than in the past.

While the pandemic challenged many industries, there are a few that have been able to nimbly recalibrate their production and processes to meet changing needs. We have seen our customers in the business of food and beverage, pharmaceutical, machinery, water & wastewater, healthcare, and data centers weather the storm using tactical technologies to answer changing market demands.

**4. How does IoT help the quality of life of society, especially the under-privileged during this outbreak of COVID-19? Could you share some insights on this?**

We are already witnessing how IoT which connects everyday objects to the Internet or owned network—can help us transform our world for the better.

At the community level, our products enhance the efficiency of critical industries, our expertise enables us to create reliable decentralized energy grids, and our IoT solutions bring critical infrastructure into the digital age – for example, EcoStruxure™ for Healthcare helps us connect and digitize hospitals, augmenting their ability to improve patient care.

Beyond that, advanced data analytics, IoT-enabled devices, and sensors are helping to reduce air pollution in some of our world's biggest cities, improve agriculture and our food supply, and even detect and contain deadly viruses. The use of IoT will also contribute to the building of smart cities, cleaner air and water, smarter sustainable agriculture, and cutting food waste. All of which when achieved will result in better standards of living.

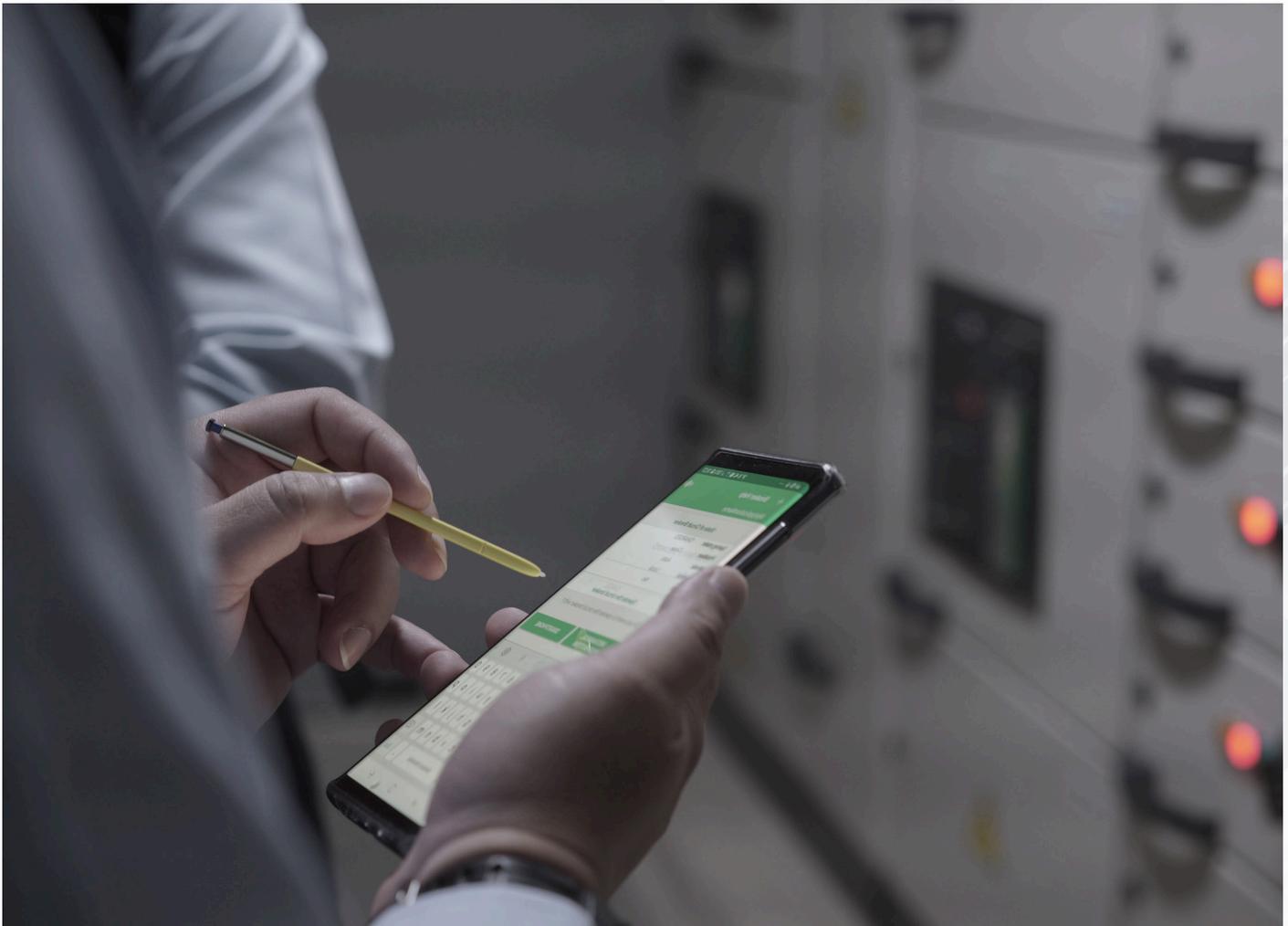
On the Corporate Social Responsibility end, the Schneider Electric Foundation launched the “Tomorrow Rising Fund” earlier this year to help vulnerable communities respond, recover, and become more resilient in wake of COVID-19. In Malaysia, we have donated RM48,375 (€10,000) and 45 refurbished laptops to Dignity for Children, which will provide children with access to technology and aid them in their online learning.

**5. In your opinion, will IoT emerge as one of the top digital transformations in Southeast Asia's industries?**

Well, in my opinion, IoT is already a key digital transformation in Southeast Asia. But the people behind Schneider Electric are looking at ways to increase IoT's capabilities even further. One of them would be Edge Computing that is poised to start a new trend in this part of the world.



*Together with Dignity for Children Foundation, Schneider Electric ensures that no children are left behind by donating laptops and funding in terms of food, medicine and school supplies to help them cope during this pandemic.*



*Schneider Electric solutions working behind the scenes at Mayapada Hospital, providing them with integrated solutions and reliable experts.*

## 6. What is Schneider's growth strategies, say for the next 5 years in Southeast Asia?

In 2020, we learned new ways to live and work. As for Schneider Electric, we learned different ways to interact with our partners and customers. We are doing things differently through empowerment and leveraging technology. Over the next few years, we are set to continue to focus on providing energy and automation digital solutions for efficiency and sustainability. In brief, Schneider Electric's key pillars for strategic growth are Digital, software, services, and resilient segments.

## 7. Could you share with us your advice towards the industry players in Southeast Asia that wish to venture into IoT?

Choose an IoT solution that can help your company to reshape, adapt, and transform your business to scale and accelerate growth. Here are some tips and key learnings that I have observed over the years which might be of use to others.

- Organizational and cultural change is often underestimated – change of mindset takes time and people with the right expertise
- IoT projects might take longer than anticipated – always include a buffer in your timeline and review it as things progress
- Necessary skills are not available in-house – upskilling is important. Try to work with the talent you have first before reaching to external sources.
- Security is often an afterthought – never deprioritize this just to get the first product out quickly.
- Interconnectivity issues are a major complexity driver – it is never a straightforward task when you need to get complex software to speak to each other. Always think through the details and gaps in the system.
- Scalability becomes an issue when deploying to a large number of devices – when numbers are too big, the hardware could become an issue usually because they are not powerful enough, data models too slow, or legacy equipment that needs upgrading too.



# Thriving in the “New Normal” with Industrial Artificial Intelligence

As corporations adapt to the “new normal” of extreme volatility, uncertainty, complexity and ambiguity (VUCA), many are turning to Industry 4.0 technologies and AI capabilities to automate fundamental industrial processes.

Automate Asia spoke to Ron Beck, Marketing Strategy Director on how Industrial AI could give corporations greater resilience, flexibility and agility—and with that, the ability to respond to shifting market conditions and thrive even in times of uncertainty.



**Ron Beck,**  
Marketing Strategy Director,  
Aspen Technology, Inc.

During the past decade, Ron Beck has been responsible for marketing in Engineering & Construction sector, Engineering product portfolio, Aspen Economic Evaluation and Aspen Basic Engineering software. Beck has well over two decades of experience in evangelizing software solutions to process industries and over a decade in commercializing chemical engineering technology.



*Aspen Technology delivers new Industrial AI solutions to accelerate the journey to the Self-Optimizing Plant*

**1. AspenTech serves as a solution provider that focuses on Artificial Intelligence (AI) and machine learning to oil and gas, chemical, and engineering companies. Could you briefly elaborate on this? What is AspenTech’s key to success since its establishment?**

The key to AspenTech’s success over the past 39 years has been to focus on the industry’s challenges and value levers, coupled with strong domain expertise and engineering knowledge. AspenTech recently pioneered a new approach to AI and machine learning called ‘Industrial AI’. The approach combines the basic digital models which make current oil and chemical assets operate safely, which are known as first-principle models, with advanced analytics models (or AI machine

learning), and industry domain expertise. By combining these three models, practical solutions can be created to break new ground in the ability to model hard problems, predictive insight into what will happen, and intuitive usability to make these advanced solutions accessible to regular industry workers.

Powerful process simulation, multivariate process control, and production planning are innovations we have delivered to industry over the past 39 years, and which 2,300 companies worldwide are using to create value. The R&D power behind these models has always involved strong collaboration between AspenTech, customer domain experts, and academia innovators with more than 2,000 man-years of chemical engineering and domain expertise.

Process simulation models, introduced by AspenTech beginning in 1981, created the foundation for rapid growth and innovation in chemicals and oil and gas over the past 30 years. These included the ability to introduce new products and processes quickly, to scale production to meet the demands of the rapidly growing Southeast Asian middle class and economy; as well as to support safety and energy conservation in increasingly complex operations.

To take the next leap, we have added some of the best AI and data science minds to our teams. The combination of chemical engineering and data science knowledge is creating exciting practical, Industrial AI results.

Over the past four years, we have introduced exciting Industrial AI technologies. The first was Aspen Mtell, which can predict equipment degradation up to 60 days in advance. Last month, we introduced Aspen Hybrid Models, which combines our award-winning Aspen HYSYS modeling system with machine learning; and similarly, we've just introduced new digital solutions based on our PIMS-AO planning modeling system and our DMC3 advanced process control system.

We see tremendous potential to apply these innovations to sustainable oil & gas and chemical industrial companies.



*aspenONE V12 software delivers a new era of Industrial AI and leverage cloud at enterprise scale*

## **2. How can Malaysian firms assess their industrial AI readiness and examine a framework for organizational preparedness? What are the critical factors for Industrial AI readiness?**

To put it simply, all companies need to move quickly to begin to adopt elements of AI today, or what I have referred to above as Industrial AI. Malaysian companies have most of the elements in place to begin adopting AI solutions that will create value.

But first, let me correct a few common misconceptions. A company does not need an army of data scientists to succeed in this endeavor. Nor does a company need very large quantities of data. The best AI-based solutions are designed to

be used by today's workers, operators, engineers, planners, traders, maintenance people, and managers to support strategic decision-making and agility. These solutions will employ powerful analytical engines on the inside, but provide an intuitive workflow and interface on the outside to support the manner in which decisions are made and work is performed.

Malaysian firms need two things for a successful industrial AI strategy. First is company leadership that understands and embraces that digital "disruption" (in the form of industrial AI solutions brought into their business mix). Such disruption must be vigorously pursued to be resilient and emerge as a leader in the current economic environment. Second is the selection of team leadership for this transformation who both understands the business and technology well.

Once those two things are in place, do ensure there are two ingredients of implementation and organizational readiness. The first is to develop a plan that will map implementation of AI against areas of the business challenge, or initiative, or need. The second is to understand the need to make the organization flatter, more collaborative, and more agile.



*Aspen Hybrid Models are a major advance in the field of chemical engineering*



### 3. A major challenge for most industrial organizations is not a lack of data, but a lack of accessible and useful data for industrial AI. How can companies effectively address this key gap?

A key element of useful Industrial AI solutions is adding intelligence to the system to assist in the organization, aggregation, selection of useful data. I would argue that this needs to be thought of in reverse. First, business challenges need to be addressed and then understand which data is needed for insights relative to those challenges. This then will value different data as to whether it helps provide insight in solving those challenges. Hence which data areas are most productive to invest in.

### 4. What defines a 'Self-Optimizing Plant'? How does it benefit companies to drive maximum profits, minimize environmental impact, and ensure greater reliability and efficiency?

The Self-Optimizing Plant is AspenTech's strategy for taking customers on a journey to the future intelligent plant, asset, or set of assets. Our vision for the Self-Optimizing Plant (SOP) is a plant that is self-learning, self-adapting, and self-sustaining. By self-learning, we mean that the plant, as it operates, learns from each action it takes, s from the data streams reporting on the plant and from the digital twins

providing operating insights. Therefore, it improves its ability to reach its potential and even set the potential higher based on its learning. By self-adapting, we mean that the plant will continually adjust to changes in the condition of the asset itself, as well as to external factors, to change the objectives of the operation continually. By self-sustaining, we mean that the plant will intelligently monitor the health of its equipment, processes, and systems, based on data streams and insights from those data streams. It will then take corrective actions to ensure the integrity of the asset, and the health of the equipment, to avoid or minimize degradation, and to avoid missing customer targets.

Our target is to reach a capability for the asset to be self-sustaining. Some aspects of operations may become autonomous in the relatively short term. But broader autonomy is a longer-term goal. That choice of words is a conscious strategy decision on AspenTech's part. Typically, oil and chemical assets are too complex to be able to run completely autonomously,

at least within the next five to ten years. Instead, we are driving toward enabling a self-sustaining plant.

With respect to sustainability and environmental impacts, these capabilities will be crucial to navigate the complicated technical, operational, and business trade-offs required to make energy and chemical assets move towards zero carbon and reduce levels of waste production and water usage.

Most companies in the chemical and energy fields are beginning to set ambitious sustainability targets, to ensure that they contribute to future sustainability and maintain access to capital. Achieving progress in areas such as carbon neutrality, a circular plastics economy, and water conservation, are complex challenges. It is a complex optimization challenge that requires looking at a company's assets, its value chain, and its optionality. The self-optimizing plant will be critical to achieving these goals.



*Industrial AI: The driving force of Industry 4.0*

## 5. What are AspenTech's expansion plans, priority growth areas, and market outlook for the next 12 months in Malaysia and Asia Pacific region?

Beyond the current economic disruptions globally, all projections still show strong GDP growth across Southeast Asia over the next 10 years. Our level of engagement with industries and companies in Southeast Asia continues to grow. In fact, the level of technical talent in Malaysia, Thailand, Indonesia, and Vietnam is impressive. So, while the current climate remains to be turbulent, we are optimistic as to the opportunities and growth in the region. We are prepared to support the growth as it happens. We have already demonstrated our willingness and intent to put in place local talent as the opportunity presents itself.

## 6. Do you have any key advice for organizations that are exploring Industrial AI?

Industrial AI, data science, and analytics are key areas that are moving very quickly from a technology and solution viewpoint. Companies must select strong partners with the capability and strategy to “future-proof” their solutions. It is important to work with a technology supplier who has a clear strategy and vision. Also, implement a technology architecture that can adapt rapidly to changes in the availability of the technology building blocks.

Create an AI plan that maps to your business strategies, key business challenges, and value levers. Industrial AI is already a proven value creator. It is important to understand your companies value levers, and apply technology in the right places. The companies that are moving ahead with industrial AI solutions are already gaining a market advantage.



*Self-Optimizing Plant learns from the digital twins which provides operating insights*



*Process simulation models create the foundation for rapid growth and innovation*



*Create an AI plan that maps business strategies, key challenges and value levers*

# Continuing the Automation Legacy



## Migrating Legacy Control Systems towards Industry 4.0

Today, it's unlikely that you would see somebody going about their morning commute on a Penny Farthing. However, advancements in technology and the need for light, portable transport mean that the 19<sup>th</sup> century bicycle is making a comeback. Could manufacturers learn a lesson from holding on to older technology? Here, John Young, APAC director at industrial equipment supplier EU Automation, discusses the benefits of bringing legacy control systems into the fourth industrial revolution.

The cyclopic is an electric, foldable bike that's set to be the most compact on the market. The invention takes inspiration from the Penny Farthing. Its handles are fixed upon the larger front wheel, and the

back wheel folds inwards so the bike can fit into a portable bag that rolls along. The cyclopic is designed to offer users with a space-saving, lightweight solution to city travel.

While manufacturers don't use equipment that has been around as long as the original penny farthing, most facilities do still rely on older equipment in their production lines. As the first generation of factory automation comes to an end, the future of many control systems may seem bleak. In fact, a 2019 survey carried out by Dell Technologies found that 91 per cent of midsize and larger organisations face major hurdles to digital transformation. The notion that these organisations should scrap all their legacy systems in favour of new infrastructure is impractical. Instead, manufacturers should consider how their

existing equipment can connect to the Internet of Things (IoT).

### Out with the old?

"The programmable controller's time was right. It invented itself because there was a need for it, and other people had that same need." Those are the words of Dick Morley, the father of the programmable logic controller (PLC) as he reflected on his invention, 40 years later. When the PLC was invented in the late 1960s, it was built to give manufacturers better insight into their plant's processes. This need hasn't changed very much in subsequent years. Real-time machine control is still a necessity, but the adoption of new technologies means that older PLCs may be lagging behind.

So, are these legacy systems destined for the scrap heap? Not necessarily, they just need to be able to monitor more processes. If we consider the monitoring needs of a variety of industries, it is clear that each one has its own set of requirements. A water utility may be required to monitor the health of its phonelines to make sure they're working in case of an emergency; while a packaging facility that uses injection moulding may need to retrieve data on the speed of its machines.

While control systems such as the PLC won't be made redundant any time soon, their functions and capabilities will need to extend in order to manage these increased data requirements.

### Smarten up

Manufacturers may need some support to take their control systems into the future. Modern PLCs often come with an Ethernet interface, which older or less expensive systems do not have. Instead, many legacy systems adopt a sometimes-bewildering range of serial communications and proprietary protocols that lack the interoperability most manufacturers require.

This can make any modifications that integrate add-on IoT connectivity seem complex, but this does not mean it's impossible. A converter that can both interact with and extract sensor data from PLCs, and then communicate this data to external systems, could be employed. The converter acts as an IoT edge node

that is able to communicate data to the cloud through an IoT gateway, which is particularly useful for PLCs with wiring constraints as it involves no interruption to functioning systems.

### Connecting the unconnected

Control systems are not the only pieces of legacy equipment that require an upgrade. If we think of a commonly found piece of automation equipment, such as a motor, the fundamentals of its technology have not changed over the last century. Motors are inherently simple, so it's tempting to think that they operate without any major problems.

However, motors are extremely energy-intensive and maintaining their efficiency is an important priority. To manage motor maintenance, smart sensors can be placed on the equipment to convert it into a connected device that reports on vibration, temperature and other characteristics that may signify unhealthy behaviour.

By enabling the predictive maintenance of hardware, manufacturers can plan maintenance according to the actual needs of the equipment, rather than fulfilling generic maintenance schedules. This extends equipment lifetime, meaning that it's able to integrate into a smart factory without the risk of unplanned downtime due to breakdowns.

One of the biggest hurdles when bringing older systems into Industry

4.0 is dealing with the unique, one-off characteristics of each legacy situation. Manufacturers often have to work with dated, or no, documentation for older equipment and must be careful not to create new issues. If the legacy system uses an older communication protocol, care must be taken to avoid overloading any bandwidth or processor.

Equipment obsolescence presents another challenge. As a natural consequence of continuous advancements in technology, obsolescence is impossible to eliminate completely and can lead to compatibility issues with new technologies. This need not present immediate concerns for manufacturers that have a plan and strategy in place for how they wish to upgrade. But, in cases where equipment breaks down, manufacturers may feel they have no choice but to purchase a new, expensive alternative.

This solution would undo all efforts to migrate existing systems towards Industry 4.0, lead to extensive downtime and require the retraining of staff on how to use this new piece of equipment. Instead, manufacturers should prepare to continue using the obsolete equipment by building a relationship with a reliable parts supplier who can source and send obsolete equipment so that a facility can continue to enjoy the benefits of retrofitting.

While the thought of riding a penny farthing might seem to belong in the past, its electrified reinvention with the cyclopic demonstrates that older technologies needn't be left behind. When planning a facility's Industry 4.0 strategy, it's easy to get caught up in the idea that control systems need a complete upgrade to keep pace. However, it is possible to teach old equipment new tricks, and investing in technologies that can convert older equipment into intelligent devices will help bring any plant up to speed.



# IGEM 2020 – THE REGION'S GREEN SECTOR TORCHBEARER

**Achieves Target of Over 10,000 Online Visitors from 75 Countries**

23 October 2020, Kuala Lumpur – The International Greentech & Eco Products Exhibition & Conference Malaysia (IGEM) maintained its victorious streak by completing the eleventh consecutive year with the first-of-its-kind virtual exhibition hall at [virtual.igem.my](http://virtual.igem.my) drawing over 10,000 visitors from 75 countries, fortifying once again its position as the region's most powerful green technology, business and innovation platform.

Organised by the Ministry of Environment and Water (KASA) and co-organised by its agency the Malaysian Green Technology and Climate Change Centre (MGTC), IGEM 2020 featured more than 160 exhibitors. Themed “Energising Sustainability”, IGEM 2020 focused on making a proactive and positive difference in the world by encouraging people to participate and power the green economy as an impetus to revive the global economy.

MGTC Chief Executive Officer, Shamsul Bahar Mohd Nor said, “In the past ten years, IGEM has grown to not only be a flagship event for Malaysia, but for the overall green technology sector globally. Notwithstanding the uncertainties around the global economy and pandemic, I am glad that we were able to yet again bring together governments, policymakers, corporations, and individuals, opening up new avenues and innovative solutions that are the need of the hour.”

“The United Nation, European Union and the International Monetary Fund have all identified the far reaching effects



of climate action in the green economy that can stimulate industries, create employment opportunities and empower consumers. As we continue to build back better, green agenda must be the focal point to create a more environmentally sustainable and economically stable future,” he added.

IGEM's strategic partner, the Malaysian Investment Development Authority (MIDA) and business matching partner, the Malaysia External Trade Development Corporation (MATRADE) returned this year, hosting over 200 networking sessions including curated group and personal business matching sessions between leading and emerging organisations from various industries to form strategic partnerships and increase green investments across the region.

The five-day event also saw over 57 conference sessions and 77 pocket talks by both local and international key industry leaders and green experts on topics such as energy, green technology, green finance, climate action, waste management, policy analysis and women empowerment. These sessions provided much needed insights to green entrepreneurs as well as other industry members who are currently contemplating their prospects in the sustainability industry.

Shamsul Bahar continued, “Despite the challenges and various unknowns faced, I am proud that we were able to persevere and not only successfully complete another year of IGEM but be able to do so with a large number of participants still coming from multiple countries, regional pavilions and international corporations.”

“The tremendous reception that we have received for IGEM 2020's virtual platform proves how spirited people across the globe are in energising sustainability. This further spurs MGTC to up our game to continue the country's green agenda via various climate action initiatives that will also contribute to flourish the green economy of Malaysia and the region,” he concluded.

Sponsored by PETRONAS, Solvarvest Holdings Bhd and the British Malaysian Chamber of Commerce, IGEM 2020 had a strong international presence with an array of country and regional pavilions including Canada, Great Britain, the Kingdom of the Netherlands, Belgium, China and South Korea. The virtual hall also featured three Malaysian state pavilions.

IGEM 2020 also announced a string of awards for the booths and talks, with Petronas taking the top spot for the Best Booth Design, Canada for the Best Pavilion, RWDI taking Best Microsite, Huawei for Most Creative Pocket Talk, Ant Futures for Most Viewed Pocket Talk, Sabah for Best State Booth design and Fujian Antai for Most Interactive (Business Matching and Live Chat).



# ITEX 2020 GOES ONLINE

## An Online Sourcing Marketplace for Inventions and Innovations



**Tan Sri Augustine Ong**

KUALA LUMPUR, 10 November 2020 — The International Invention, Innovation & Technology Exhibition (ITEX) will mark its 31st year with the new platform – ITEX Online that will be going ‘live’ this 20 November.

Since its inception in 1989, ITEX is organised annually in Kuala Lumpur and has grown to become the region’s leading exhibition to showcase new inventions, technologies and products, targeted at aspiring inventors from all walks of life to get recognised and to present their creations. This year, amidst the global pandemic, ITEX Online was introduced to take centre stage with a convenient borderless invention platform to feature a community of inventors and a virtual sourcing marketplace for commercialisation.

YBhg Academician Emeritus Professor Tan Sri Datuk Dr Augustine S. H. Ong, the founding President of MINDS and Joint Organiser of ITEX said: “As the world races to find new solutions and take quantum leaps in the realm of technology, I continue to hold inventions close to my heart, and I take this opportunity to strengthen my conviction that the sky is the limit when it comes to creativity and ingenuity of the human mind.”

The digital age is well and truly upon us and reinvention continues to remain relevant as inventors and investors alike

chart their new visionary path regardless of situation and space”, he continues.

The Online edition of ITEX this year became a new option in view of the worldwide travel restrictions due to the pandemic. As of today, inventors and innovations from 15 countries such as Australia, Canada, Croatia, Hong Kong, Indonesia, Iran, Poland, Qatar, Romania, Taiwan, Thailand, Turkey, Ukraine, Vietnam and Malaysia have gathered online to showcase close to 500 inventions on this platform, that will be made easily accessible within the finger tips, 24/7.

Across the 2-day online experience, other activities will also highlight the virtual event, where visitors and audiences who are potential venture capitalists or investors can get in touch with the inventors for potential joint ventures or collaborate on the projects towards the road to commercialisation and vice versa, inventors can in the near future, could also participate in pitching sessions that will be organised in collaboration with relevant organisations.

Another highlight to ITEX Online this year is the concurrent World Young Inventors Exhibition (WYIE). WYIE aims to raise the awareness of budding inventors through new innovative approaches and to complement the enhanced STEM (Science, Technology, Engineering and Mathematics) curriculum introduced in schools. More than 150 inventions from local schools across Malaysia are being featured in WYIE this year, along with schools from 9 other countries.

Most of all, as ITEX strongly advocates innovation with the passion to see the

industry grow, participants, inventors, students and investors can also take this opportunity to keep up-to-date with the invention industry through a comprehensive programme line-up covering an opening ceremony, webinars, tech talks, awards ceremony and etc.

C.I.S President Dato’ Vincent Lim said: “We are pleased that our partnership with MINDS for ITEX has seen the exhibition growing from strength to strength, as a platform to nurture new inventions and innovations —towards securing investments, manufacturing, commercialisation prospects and partners. “We hope this Online edition will reach out to an even a wider audience across the globe and be the digital sourcing marketplace for inventions and commercialisations”, he further added. ITEX is jointly organised by the Malaysian Invention and Design Society (MINDS) and C.I.S Network Sdn Bhd (C.I.S).

Highlights on ITEX 2020 Online Platform will take place virtually on:-

### 20 November 2020 (Friday)

- |         |   |
|---------|---|
| 10.00am | Virtual Opening Ceremony of ITEX Online by Guest of Honour, YB Datuk Seri Dr. Noraini Ahmad, Minister of Higher Education, Malaysia |
| 2.30pm  | Webinar: VC2E (Venture Capital to Entrepreneurs Talk) by MVCA   |

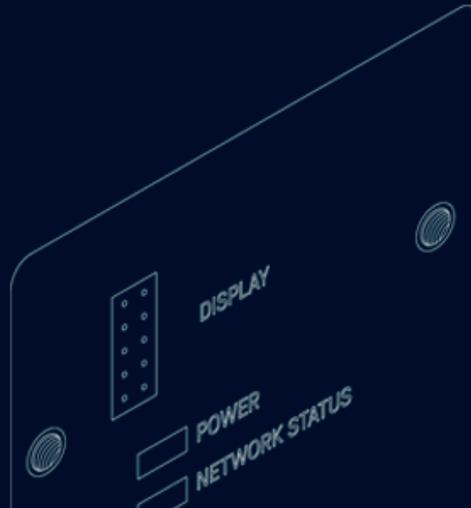
### 21 November 2020 (Saturday)

- |         |   |
|---------|---|
| 9.30am  | Webinar: Tech Talk by AIPO (Association of IP Owners)               |
| 11.00am | Webinar: Tech Talk by IET (Institution of Engineering & Technology) |
| 3.00pm  | Virtual Ceremony for Local and International Winner Announcement    |

# Virtual product launch

17 NOVEMBER 2020

PROCENTEC  
Member of the HMS group.



## New Diagnostic Products Aim High: Full Control of Your Industrial Network

More overview, more insight and total network control. That's what Procentec is promising the Industrial Automation Market with its product launch on 17 November, just a few days before this year's SPS Connect.

The developer is convinced that its newest bundle of products will generate widespread interest across the industry. This week, it published on its website a registration page for the virtual launch: <https://releases2020.procentec.com/>

It's encouraging all those who use PROFIBUS, PROFINET and Industrial Ethernet for their industrial networks to sign up and book a timeslot.

"These products are something field technicians have been longing for," says Pieter Barendrecht, CEO of Procentec. "A one-to-one digital session with our

crew will be an eye-opening event for them." He's clearly enthusiastic about the upcoming releases. "Our latest products will cut down on unnecessary engineer call-outs, reduce the time spent on finding network errors, and provide clear advice on how to troubleshoot. They really do take diagnostics and monitoring to a new level."

Two products in particular will be attracting the most attention. One because it's a brand new product that will reduce production downtime drastically once installed. The other because it provides an intuitive helicopter view of the entire network, yet it allows technicians to drill down to the last device and get that all important diagnostic information.

Barendrecht isn't giving away just yet the names of these two products or the other eight major product releases and scale-

ups. But he guarantees that the launch will be well worth attending, even though this year it's going to be a virtual event.

"Because of the black swan event this year, we've postponed all our releases until SPS Connect," he explains. "So, we're going to be launching in one go much more than we usually do. Even so, each release complements perfectly all the other great products in our portfolio."

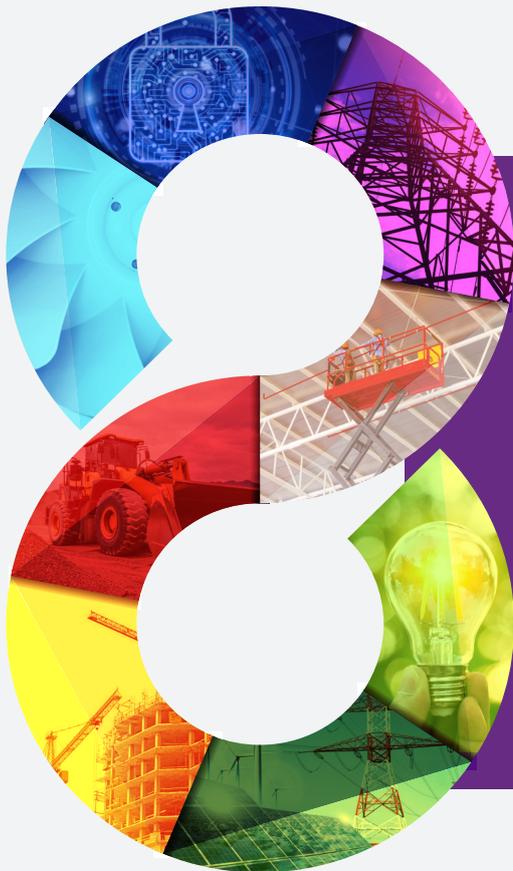
The launch is timed to immediately precede SPS Connect, which this year takes place on 24-26 November. Just like the traditional version, the virtual exhibition will be connecting manufacturers and users of smart and digital automation. Procentec will be there; its stand will offer visitors a grand tour of the company, a hands-on explanation of their new solutions, plus a few surprises.



# International **ICW** Construction Week

## ASEAN'S LEADING EVENT FOR THE BUILT ENVIRONMENT

INCORPORATING



# 15 - 17 JUNE 2021

MALAYSIA INTERNATIONAL  
TRADE AND EXHIBITION CENTRE  
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ORGANISED BY



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# Universal Robots Hosts First Virtual Collaborative Robots Exhibition & Conference in Asia-Pacific

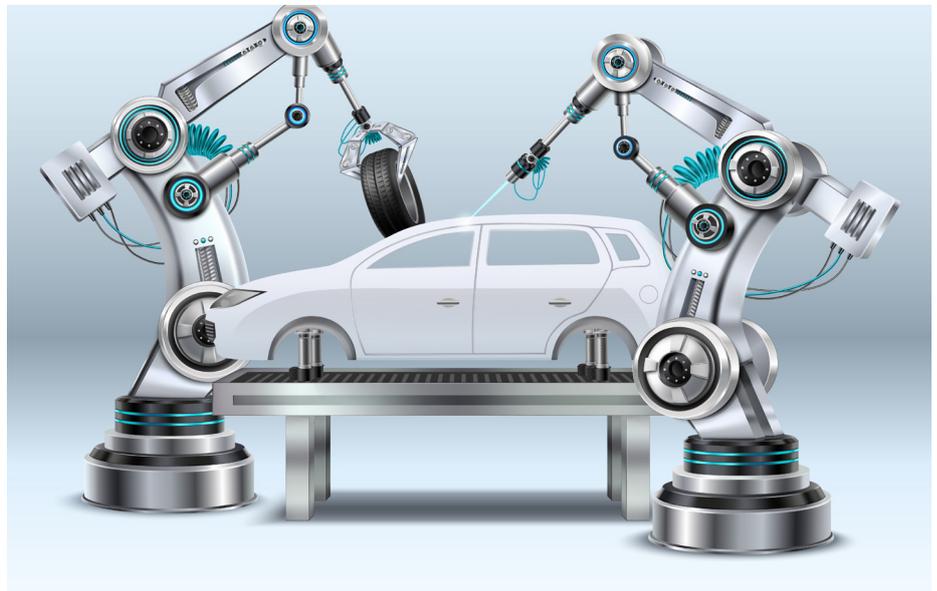
Gain actionable insights on flexible and cost-effective automation solutions addressing post-pandemic ROI and safety challenges for small and medium businesses

MALAYSIA, 22 September 2020 - Universal Robots (UR), Denmark-based collaborative robots (cobots) technology market leader, today announces Asia-Pacific's first and largest collaborative robots virtual expo "WeAreCOBOTS APAC", to be held from 6 to 8 October 2020, 10 am to 6:30 pm daily (GMT+8).

The virtual expo "WeAreCOBOTS APAC" presents an opportunity for practitioners and factory owners in Malaysia to meet with automation industry leaders and cobot experts from different countries online. Over three days, participants can attend cobot demonstrations by exhibitors, listen to enriching keynotes from industry experts on overcoming manufacturing challenges in Asia-Pacific, and find actionable answers on cobot applications in the live Question-and-Answer (Q&A) sessions. Registration is free for anyone who is interested at <https://wearecobots.apac.vfairs.com/>.

## Learn from the Best from the Comfort of Anywhere

Business owners, leaders, and practitioners who are interested in using cobots for their operations, can conveniently learn more about cobots by



attending numerous keynotes online with live Q&As, and participating in ongoing discussions during, and after the event.

Luminaries from Asia-Pacific speaking in this event include Dr Yeong Che Fai, robotics visionary and inventor from Malaysia and associate professor in Universiti Teknologi Malaysia as well as director of DF Automation & Robotics. He is a winner of more than 50 national and international awards. Dr Yeong will be featured on 6 October 2020, 1.00pm alongside Universal Robots' President Jürgen von Hollen and Asia-Pacific Regional Director James McKew to present post-pandemic state of manufacturing and how companies

in Asia can stay competitive amidst new economic challenges, as well as health and safety concerns.

## Main topics presented by various experts include:

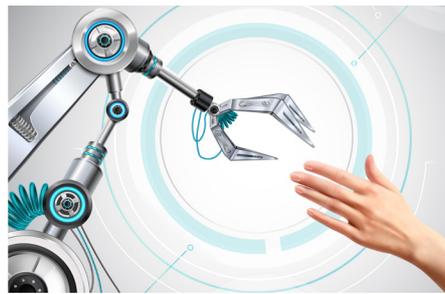
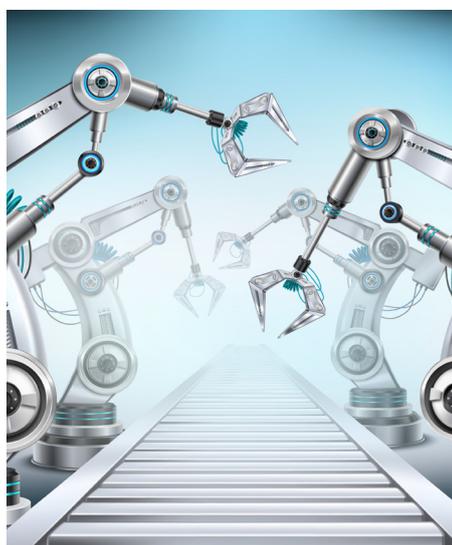
- Future-Proofing Assembly Processes with Human Robot Collaboration
- Joining the Fast Lane: Using Cobots to Achieve Automotive Manufacturing Excellence
- Continental's Journey: Enabling Zero Downtime
- Optimising your collaborative robot deployment

For more details of the agenda, please visit <https://wearecobots.apac.vfairs.com/en/keynote-schedule>.

The expo programme also features presentations and 'live' demonstrations on cobot maintenance and programming, and many new ways cobots are quickly being deployed to address the COVID-19 crisis, including area disinfection and the manufacturing of test kits. Participants can learn how cobots address challenges in productivity, quality, machine usage, and safe distancing from small businesses to large production facilities. The virtual expo also allows participants to download digital brochures.

Universal Robots, along with exhibitors including Alstrut, CKD, OnRobot, Piab, Robotiq, SCHUNK, SICK, SMC Corporation, Zimmer Group, will be showcasing cobot applications such as assembly, finishing, materials handling, machine tending, quality inspection and more.

During this event, participants will also learn about the largest and most comprehensive cobot ecosystem with over 250 components and application kits from more than 400 approved commercial developer companies in the Universal Robots Plus (UR+) programme.



### Smart Manufacturing Answers for Small & Medium Enterprises (SME) in Asia-Pacific

This virtual expo is especially geared for SMEs, providing actionable insights with minimum expenditure in light of COVID-19. There is no need for travel, accommodation and other ancillary costs, and SME owners and leaders can harness all the insights and answers from the comfort of anywhere.

Cobots can be easily and safely added into existing factory layouts and production workflows, with very short testing and set up time, to reduce human interaction especially in resource and employee-strapped SMEs. Already, Asia-Pacific SMEs and larger enterprises alike have turned to cobots to handle repetitive, dull, dangerous, dirty and difficult tasks successfully.

Shruti Engineers, a 10-person manufacturing company in India, achieved 75% production increases after installing a cobot. TCI, a 100-person plastic injection molding company in New Zealand, was able to achieve cost savings and achieved return of investment six months after introducing a cobot in the production process. Successful Asia-Pacific cobot adopters include: Beijing Bai Lear Automotive System in China, Benchmark Electronics in Thailand, BTC Mold in Taiwan, Clearpack Group in Singapore, GKN Driveline in Japan, Hyundai Induction Hardening Heat Treatment in Korea, New Engineering Works in India, Nippon Zettoc in Japan,

PT JVC Electronics in Indonesia, Tsung Shih in Taiwan, VMIC in Vietnam and many more. For more such successes, please visit <https://www.universal-robots.com/case-stories>.

“Manufacturers are faced with a multitude of challenges today, ranging from production efficiency, aging population, health and safety concerns, to keeping up with the Industry 4.0 revolution. The COVID-19 crisis has pushed the region into a hyperdrive of technological adoption. Business owners in Asia-Pacific are exploring reshoring options to prevent business disruptions due to supply chain disruptions, as well as designing flexible and adaptable automation solutions for rapid changes in demand. Cobots are viable solutions in both situations. We hope this expo can immediately support more manufacturers in Malaysia assess new solutions which are cost-efficient, easy to implement, and improve profitability quickly,” said **James McKew, Regional Director Asia-Pacific, Universal Robots.**

### About Universal Robots

Universal Robots (UR) was founded in 2005 to make robot technology accessible to all by developing small, user-friendly, reasonably priced, flexible collaborative robots (cobots) that are safe to work with. Since the first cobot was launched in 2008, the company has experienced considerable growth with the user-friendly cobot now sold worldwide. The company, which is a part of Teradyne Inc., is headquartered in Odense, Denmark, and has regional offices in the United States, Germany, France, Spain, Italy, UK, Czech Republic, Poland, Hungary, Romania, Russia, Turkey, China, India, Singapore, Japan, South Korea, Taiwan and Mexico. In 2019, Universal Robots had revenues of USD 248 million. For more information, please visit [www.universal-robots.com](http://www.universal-robots.com).

# Cracking Digital for an End-to-End Traceability Journey



We are all consumers, which is why we are more and more concerned about the food we eat and its safety. We have also become more responsible consumers, buying more green and sustainable products. Further, this fact has been accelerated during the global pandemic we are still facing worldwide.

Trends such as global and complex supply chains, stringent regulations, booming e-commerce, and mobile apps for end-consumers are pushing the food industry to provide more complete, traceable, and transparent product information along the whole value chain. It becomes more and more mandatory for brands to invest in food and beverage traceability to provide the right information to consumers and to ensure food safety by fully controlling their supply chain, end-to-end.

But which digital technologies and solutions enable food and beverage stakeholders to build a credible, integrated, transparent, and trustworthy value chain from sourcing to end-consumers, while addressing supply chain efficiency and food safety and sustainability requirements?

## End-to-end traceability journey at Danone

We talked to Yasmine Achab, Transparency and Traceability Global Program Director at Danone Specialized Nutrition Division, “Consumers are asking for more and more transparency. And as a mom, I would like to know where my baby milk is coming from, which ingredients were used, and first and foremost, I want to make sure that it is a safe product.” Danone’s mission is to serve life and bring health through food to as many people as possible, especially for their Specialized Nutrition Business where safety and quality are crucial, as there is no margin of error when it comes to a baby’s health.

Danone engaged in this journey years ago to bring more trust to consumers and in particular, to give parents the “peace of mind” you need when you first start.

The end-to-end traceability journey started four years ago at Danone Specialized Nutrition in startup mode with a small team, gathering knowledge from different sources with the idea of finding a way to secure the Infant Formula packaging beyond the company’s quality standards and basic safety guidelines.



The solution in place today consists of providing a unique digital identity to every single product by laser marking two QR Codes – one on the outer side of the pack that can be scanned several times, and another one inside the pack available only after purchase that is scannable only once. Those two codes are linked together, thus providing the additional layer of security to consumers. This is now opening an endless world of opportunities regarding end-to-end traceability and enabling Danone Specialized Nutrition to better connect with their consumers by providing them information on the product journey, nutritional advice, answers to their questions, guidance, and more.

To start an end-to-end traceability journey, you need a certain level of maturity inside your company. The prerequisite for starting is to master your traceability at the batch level through digital solutions. Mastering the traceability at different levels of granularity (batch, pallet, cartons, item) requires very good management of processes and data through different systems used within a company, for example, Manufacturing Execution Systems (MES).

As part of this journey, Danone Specialized Nutrition has implemented a serialization and aggregation solution, engaging not only their network but also their external stakeholders (such as distributors) to ensure complete end-to-end traceability.

“As the supply chain is scattered, it is a real challenge to control the data, and that’s why not many industries do detailed traceability. We need to decide how to

manage and exchange data with all those hundreds and hundreds of partners,” mentioned Yasmine.

That’s why Danone Specialized Nutrition is ultimately using blockchain technology as a platform to exchange data with their entire network of suppliers and partners and to ensure data cannot be tampered with.

Starting an end-to-end traceability journey is a use case for the digital transformation of a company. It starts at the plant level, leveraging different digital solutions and technologies and selecting the right granularity of traceability data applied to a company’s needs and/or strategy.

The challenge is to orchestrate all the different layers of the converging OT and IT solutions, enabling the plant to connect with the entire ecosystem, upstream and downstream.

“Another important thing is that you need to remain focused on your business goal, before you screen the market, define, or look for technologies and then you use technology to serve your business objective and not the other way around,” added Yasmine.

It is also about building strong relationships with your partners and suppliers to learn and build the competencies internally. Agility is also key to starting your journey, beginning small, and then scaling up, adjusting



your direction when needed. The process also involves an internal transformation within the different teams involved: Information Systems, Plants, Supply Chain, Quality, Marketing, and others. Finally, if this is not on the central agenda of the company, then it might just remain an idea in incubation that will never come to reality. You need the right sponsorship within the company to make decisions, to push things to happen, and to scale up investments.

“We just started our journey. We’re gearing up with various markets across the globe. We are consolidating our learning and experience, and we would like to bring many improvements in the years to come, such as investing more on topics like transparency, upstream traceability, and also sustainability,” concluded Yasmine.

Pushed by new regulations and standards emerging – with the example of the Sustainable Supply Chain Initiative from the Consumer Goods Forum – and by a global awareness on sustainability –supported by the United

Nation Sustainable Development Goals – product Information is quickly evolving to integrate more nutrition information (i.e. the Nutriscore in Europe), animal welfare (i.e. “La Note Globale” in France or new animal welfare labels), carbon footprint information (CO<sub>2</sub> or climate score emerging), as it becomes imperative for brands to engage in an end-to-end traceability integrated approach.

Sustainability is imperative for brands to engage in an end-to-end traceability integrated approach.

To start your end-to-end traceability journey, these are the four main takeaways:

1. Your end-to-end traceability journey should be part of your company strategy. That implies leadership, agility, speed to move forward, and the involvement of the entire ecosystem of a company, including its suppliers, customers, and partners
2. It is key to dedicate a global cross-functionalities team that will be able to address the entire Value Chain, sometimes moving ahead from traditional silos within a company. As a result, it must be a centrally led approach.
3. However, not only is it a collaborative approach –in this journey, you need to welcome open, scalable, and flexible solutions and partner integration when you select the solution – but you also must ensure that the partners are responsible for the overall solution implementation.
4. Finally, start small; don’t select a technology, but target the right “use case” in terms of market and/or product, scale fast, and learn from it to adjust quickly before taking any next steps.

EcoStruxure™ Traceability Advisor enables a complete vision of your supply chain by capturing and analyzing data from different sources and stakeholders.



# The Robot Dolphin That Could Replace Captive Animals at Theme Parks One Day



*An animatronic dolphin built by Edge Innovations is seen in a tank at the company's warehouse in Fremont, California, U.S., September 30, 2020. REUTERS/Nathan Frandino*

Darting around the pool as a group of swimmers stands in the shallow end, the dolphin looks much like those that jump through hoops and perform acrobatics at theme parks.

But this marine creature is a robot. “When I first saw the dolphin, I thought it could be real,” said a woman who swam with the remote-controlled creature.

Edge Innovations, a U.S. engineering company with an animatronic and special effects division in California, designed the dolphin for an educational pilot program.

It hopes that life-like animatronics used in Hollywood movies could one day entertain crowds at theme parks, instead of wild animals held in captivity. Swimmers could dive with robotic great white sharks or even reptiles that filled Jurassic-era seas millions of years ago. “There are like 3,000 dolphins currently in captivity being used

to generate several billions of dollars just for dolphin experiences. And so there’s obviously an appetite to love and learn about dolphins,” said Edge Innovations founder and CEO Walt Conti.

“And so we want to use that appetite and offer kind of different ways to fall in love with the dolphin.”

Animatronics may bring back audiences turned off by parks using live animals, said Conti. Some 20 European countries have already banned or limited the presence of wild animals in circuses.



At Edge’s Hayward, California headquarters, its 550-pound (250-kg), 8-and-a-half-foot (2.5-meter) animatronic dolphin with skin made from medical-grade silicone headlined a program for schools in partnership with TeachKind, part of People for the Ethical Treatment of Animals (PETA).

Edge also made the aquatic creatures used in Hollywood blockbusters “Free Willy,” “Deep Blue Sea” and “Anaconda.”

“The idea of this pilot is really to create a kind of “Sesame Street” under water,” said Roger Holzberg, creative director for Edge’s animatronic program.

“Those characters taught a generation how to feel about different kinds of aspects of humankind in ways that had never been imagined before. And that’s what we dream of with this project.”

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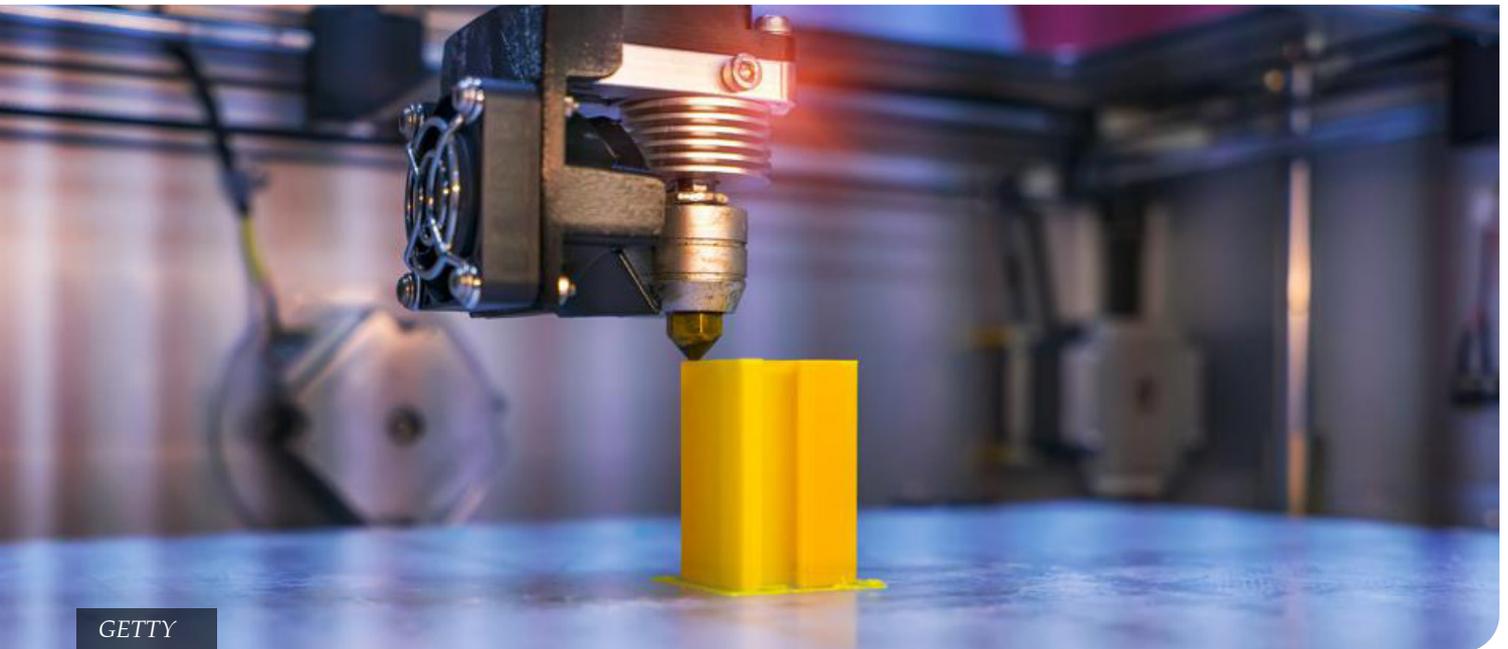
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# 10 Exciting Ways 3D Printing Will Be Used in the Future



GETTY

As 3D printing continues to mature, its practical uses are seemingly infinite. From artwork and toys to entire buildings and even transplantable organs, this technology can go as far as our imaginations will allow.

While 3D printing may be most exciting for companies looking to streamline their prototyping technology, its potential for the non-tech consumer world is growing and evolving. That's why we asked members of Forbes Technology Council what potential uses of 3D printing non-tech companies should be excited about and why. Keep an eye out for its use in these 10 applications.

## 1. DIY Product Prototyping

Prototyping of products has long been the barrier to innovation because inventors could do little more than dream about a product or idea. A friend's 12-year-old son ordered a 3D printer on the internet, set it up without any parental

guidance and started manufacturing fidget spinners. For a couple of weeks, this kid was making a killing—until all his classmates bought 3D printers. - *Jack Weiss, Marena Cosmos*

## 2. Additive Manufacturing

Additive manufacturing is an important supply chain management tool that's currently helping the U.S. Army enhance readiness to support soldiers on the battlefield. Because it relies on digital blueprints, the authenticity, confidentiality and integrity of the "digital thread" is critical to mitigating risk while achieving successful outcomes. - *Arshad Noor, StrongKey*

## 3. Rare Parts Replacement

The potential of metal-based 3D printing will allow for the creation of rare discontinued replacement parts in a wide variety of applications. Repair shops could handle a much wider variety of clientele, and online retailers may be able

to print unique parts, providing more products through a just-in-time inventory approach. - *Luke Wallace, Bottle Rocket*

## 4. Automotive Prototyping

3D printing has overcome the hype and is now broadly adopted by non-tech businesses. The automobile industry is using it to rapidly prototype new car models. 3D printing is used to produce spare and replacement parts in sectors such as aerospace. Healthcare has a wide variety of 3D printing applications ranging from molds in dentistry to prosthetics, as well as 3D printed models for complex surgeries. - *Swathi Young, Integrity Management Systems Inc.*

## 5. Fraud Prevention

3D printing is showing promise in terms of preventing card-present fraud in things like point-of-sale systems and ATMs. For example, banks are now using 3D printing to design and produce ATM components that prevent credit card skimming. As

the digital and physical security worlds meet, 3D printing will play a vital role in creating hardware to fight fraud. - *John Shin, RSI Security*

## 6. Customizable Solutions

The shift from broad, one-size-fits-all solutions to more customizable and personalized offerings has been a major trend in recent years, and 3D printing has the potential to take it a step further. Companies will be able to offer greater flexibility and personalization on the specifications and design of products sold without the need to dramatically mark up the cost. - *Ron Cogburn, Exela Technologies*

## 7. Manufacturing and Logistics

3D printing is upending the status quo for how companies develop, build and deliver products. People are even 3D printing food and houses on site! Thanks

to this technology, sourcing for raw materials, manufacturing and logistics will never be the same. The efficiency, flexibility and lower costs that 3D printing brings can change how organizations get things done in practically every industry. - *Marc Fischer, Dogtown Media LLC*

## 8. Lowered Production Costs

3D printing is being used to lower costs for companies so they can offer products at lower costs. For example, in 2018 ICON 3D printed a house at the South by Southwest festival. It not only could be used to provide sustainable housing around the world but could also help people affected by natural disasters by quickly providing replacement housing. - *Thomas Griffin, OptinMonster*

## 9. Apparel Printing

I think the apparel industry is ripe for disruption with 3D printing. With 3D,

customers can print their own gloves, belts and glasses to meet their needs. This can provide co-creation opportunities for retailers and provide personalized design to customers. - *Buyan Thyagarajan, Eigen X*

## 10. Medicine and Healthcare Applications

I see 3D printing having a tremendous impact on medicine and general healthcare in the coming years. There are millions of people who need access to affordable prosthetics, and 3D printing is a cost-effective solution. It gives medical staff the ability to map and uniquely design each printout to a patient's specific needs. This technology will certainly improve the lives of many people-*Abishek Surana Rajendra, Course Hero*

Source: [www.forbes.com](http://www.forbes.com)

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