

GOING ROBOTIC

The benefits of automation and robotics are clear, yet they are huge investments – especially for SMEs – but there will be more solutions available as well as government assistance schemes



PHOTOS: YEN MENG JIN

“ONE ROBOT CAN REPLACE THREE HUMAN BEINGS. AND THE PERSON WHO IS HANDLING THE ROBOT ONLY NEEDS TO SPEND 60 PER CENT OF HIS TIME HANDLING THE ROBOT. HE CAN SPEND 40 PER CENT TIME OF HIS TIME LEARNING OTHER THINGS. YOU JUST NEED TO LOAD IT, PRESS A BUTTON, AND THEN YOU CAN WALK AWAY.”

– Eunice Ng, technical director, Ugene Laboratory Services

IN THE world of microbiology laboratory testing, Ugene Laboratory Services is quite unique, technical director Eunice Ng promises. In the last five years, it has been aggressively automating – something which others in the industry shy away from, she says. Last year, Ugene Lab, which is an industrial microbiological testing laboratory which provides diagnostic tests for products including general food products and traditional Chinese medicine, brought home its biggest and most impressive investment yet – a blue and white robot (with a head no less) – that was designed specifically for Ugene Lab’s use.

Ms Ng admits that this is a plan that she has had for a number of years. But because of the hefty investment demanded of the customised robotic system which was co-created with a Japanese automation consultancy, she decided to automate other aspects of the laboratory first.

“One robot can replace three human beings. And the person who is handling the robot only needs to spend 60 per cent of his time handling the robot. He can spend 40 per cent time of his time learning other things. You just need to load it, press a button, and then you can walk away,” she says.

One of the key factors that pushed Ugene Lab down the route of automation and robotics is the growing scarcity of technicians skilled in microbiological testing. On the flip side, there has been increasing demand for food safety testing due to a surge in food exports from Singapore, for which food testing services are mandatory, and an increase in food imported by Singapore for which manufacturers contact local testing bodies for food safety clearance.

“The people who work here have an interest in this field. They don’t necessarily just go for money. They want to be involved in bigger projects rather than come in everyday to weigh samples. . . If you get a diploma

holder to do the daily routine work again and again, they will lose interest, because they are like production workers. If you have some automation then they can learn troubleshooting, be involved in planning how to be better, how to be more productive – they will feel like their job is worth it,” says Ms Ng.

“Identification of bacteria is one area I want them to go into. You cannot just know how to culture the bacteria, you must learn to identify them as well. These are the more high-end (areas I hope to train staff after they have the necessary) experience.”

According to John Lu, director, manufacturing and engineering at Spring Singapore, the rate of adoption of automated solutions has been increasing among companies, especially in sectors such as food manufacturing and engineering. There is however, currently a low adoption rate of robotic solutions by small and medium-sized enterprises (SMEs) in Singapore, especially for those in the services sectors.

Automation refers to the use of automatic equipment, such as electronic machines or devices in companies’ processes or facilities. Robotics, on the other hand, is a branch of automation technology that deals with the application of robots to operations.

But Mr Lu says that he expects more SMEs to take up these robotic solutions in the coming years with the rising availability of solutions as well as government assistance schemes aimed at this area. Spring is, for instance, currently working with some companies in the food and beverage (F&B) and logistics sectors to support their adoption of robotic solutions.

Techmetics, for instance, is an automation firm that deploys robotic solutions for companies in the hospitality and F&B industries. It launched a service robot used in hotels and F&B establishments in Singapore; the robot is able to relieve service staff of

labour-intensive and repetitive tasks, such as delivering food and drinks, as well as toiletries and luggage.

“We have identified sectors such as F&B, food manufacturing, precision engineering, health care, logistics and hospitality to benefit most from automation and robotic solutions. We hope that companies in these sectors will be more proactive, and we will encourage them to adopt automation and robotic solutions by running pilot trials for solution testing,” says Mr Lu.

Increasingly, innovative robotic solutions are being designed for companies in the service sectors. “We are continuously driving the creation of new solutions for different sectors. In order to spur innovation and encourage new entrants to the market, we have been creating opportunities for those keen to create new solutions to come forward through platforms such as competitions and events,” says Mr Lu.

Spring jointly organised the second run of the Tech Factor Challenge with ST Electronics in 2015 to get participants to create new robotic solutions to address the needs of various industries. Participants were required to conceptualise and build robotic waiters. They were then given the rare opportunity to test their robotic solutions in an actual restaurant.

“This is very valuable as the participants could better validate the commercial potential of their technological solutions, refine them based on the tests conducted in a real-world setting, and align their R&D efforts to meet market needs and expectations,” said Mr Lu. The run in 2015 was the first time that Spring and ST Electronics partnered food industry players, ABR and Food Glossary, to secure test-bedding opportunities for the teams.

Sanwa Plastic Industry is another company that has moved into automation in a big way. Founded in 1977, Sanwa Plastic specialises in mould design

and fabrication, injection moulding, mould maintenance and assembling of thermoplastic injection moulded products. It decided to integrate the automation with its moulding machine which will now conduct both the moulding as well as testing and reliability checks.

As the manual test and inspection processes are highly labour-intensive, the implementation of the two automation solutions have helped significantly

in making the process more manpower-efficient, with a reduction of a total of 11 operators from an original staff headcount of 15 (70 per cent reduction).

And, as pointed out by Ugene Lab as well, automation and robotics have no “moods”. The output is standard – barring malfunction – both in quality and quantity.

In the case of Sanwa, this issue was exacerbated because every time staff went for a break, there would be stoppages. In injection moulding, the machine needs to stabilise before the parts produced are usable. This resulted in a lot of wastage. Not that deciding to automate was a decision taken lightly.

“First, we needed to study whether or not we are lean. If we are not lean and we make a lot of unnecessary waste, we can automate but productivity will be up, but waste will also be up,” says Ricky Souw, group chief executive officer of Sanwa Group. “Then you need to study what are the volumes you can run and what is the return on investment. Third, how far can we automate? It doesn’t mean (that because) we would like to automate, we can automate from A to Z. Maybe we can automate A to R.”

Indeed, it actually made more financial sense to have people handle the insertion of the smaller components into the fixture before robots load them into the mould. Says Lim Soon Huat, general manager at Sanwa: “Of course, (a sufficiently advanced) robot can do it, but the cost will be extremely high. So we have to balance to see where to put the automation to use more effectively, and then look into further improvements to integrate the other processes later.”

Having a team in-house to look at automation and a technician to maintain the system is definitely a plus point for Sanwa. Says Dr Souw: “Some SMEs, due to the talent pool, may not have people who can maintain (the system) properly. So they need to ask the system integrator to come down every time. They say ‘wow, automation is very costly!’

Of course! If you have the talent, it is better for maintenance. But, if you are running a company of say 15 people, and you get an engineer or senior technician, it is a big cost. Maybe you don’t need one whole person, maybe you just need one-quarter of a person.”

The logical solution, says Dr Souw, is to pool resources. “If three to four companies can work together and pool their resources together, they will be stronger. That’s the only way to survive if you want to compete regionally and internationally. Big companies – they don’t have these problems because they have deep pockets. But for small companies, it’s not easy to invest several thousands or even several million.”

“If you look at Taiwanese or Japanese companies, they work together. Or, they will say, ‘we don’t compete with each other. We each specialise in one thing and we work together.’ So optimise everything and not compete anymore. If they need to be integrated, they create one company to do the integration but their own companies still exist. Because they are very focused, their productivity is very high and cost is driven down.”

Dr Souw acknowledges that effecting this sort of mindset shift is difficult with local SMEs. But the younger generation is more open to such forms of collaborations, he notes.

Another way that Spring drives companies’ adoption is by encouraging collaboration with the private sector through schemes and the active forging of partnership opportunities. Spring recently established a public-private partnership to encourage companies to adopt industrial robotic applications. Spring and the Economic Development Board (EDB) supported a project involving Universal Robots, a global developer and manufacturer of flexible and user-friendly industrial robots, Skymech, Universal Robots’ system integrator and Singapore distributor, and SMEs.

The partnership allowed Universal Robots to expand its range of robot applications, which Skymech helps customise according to specific needs, to, in turn, benefit businesses across industries that intend to adopt and deploy these technologies. This collaboration is a joint effort between robot manufacturers and system integrators to help upgrade capabilities and develop scalable solutions for customers.

Meanwhile, Ugene Lab is far from resting on its laurels. The next phase for the Ugene robot is to programme it such that it is able to pour the agar directly into the plate – at the moment, lab technicians have to prep the agar for the robot. Ms Ng is also looking at introducing barcoding for products that have been tested.

“I want to build up my company in this sense, so that everything is consistent, and everything is traceable,” she says. ■

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Robotic output is standard – barring malfunction – both in quality and quantity, says Ms Ng