Addressing the need for talent in IoT

BY KHAIRANI AFIFI NOORDIN

Despite having a vibrant and growing information and communications technology (ICT) sector, local companies continue to rely heavily on foreign knowledge workers. According to an industry study of supply and demand conducted by Malaysia Digital Economy Corp (MDEC), there were 25,059 foreign knowledge workers employed in Multimedia Super Corridor-status companies in 2014.

The employment of foreign talent in the ICT sector is taking a toll on the local economy, says R A Thiagaraja, founder and CEO of K-Pintar Sdn Bhd. "Business transactions are taking place in Malaysia, but we are bringing in more foreign talent. We are paying them more money. Therefore, more money will flow out of the country. What will happen to the local economy?"

MDEC director of talent enablement Muhammad Imran Kunalan says the country is certainly not producing enough graduates to sustain the sector's needs. "Every year, Malaysia churns out almost 250,000 graduates. Of these, only about 11,000 or 4.4% are ICT graduates. That is an excruciatingly small number."

To make matters worse, the talent cannot be at the beginner's level if the country is to develop its Internet of Things (IoT) sector. "Various skillsets are needed in the IoT field. Based on my research, there are three core areas — device management, gateway integration and big data. Under these areas, there are about 22 knowledge areas," says Thiagaraja.

"Because of the amount of data you are required to work with in IoT-related areas, the talent cannot be just at the entry level; there must be talent at the intermediate and advanced levels. This makes it even more difficult to find talent for the sector."

According to MDEC's study, 10 essential skillsets are required in the ICT industry. They include software and application development; database, OS and server technologies; networking and security; business intelligence and analytics; enterprise resource planning and creative multimedia.

To address the need for the right talent and to fill the gaps in the industry, MDEC's talent enablement division is carrying out its talent development interventions. The interventions are aimed at the entire talent ecosystem, from schools to institutions of higher learning to industry.

"We are playing an advocacy role in talent development for ICT. We are working with ecosystem partners, such as the Ministry of Higher Education (MoHE), Ministry of Education (MoE), Human Resources Development Fund (HRDF) and Talent Corp Malaysia Bhd, to develop more talent for the industry. This is about creating the right talent pool for the future," says Imran.

STARTING THEM YOUNG

In Malaysia, parents tend to influence their children when it comes to making career choices. And they rarely suggest technology-related careers because they are not familiar with the jobs available or skills required.

Thillai Raj T Ramanathan, chief technology officer at Mimos Bhd, says a huge problem is that school students no longer have an interest in science, technology, engineering and mathematics (STEM). "They are running away from STEM education and moving into accounting, business and things like that. Although this problem is not exclusive to Malaysia, it needs to be addressed to develop local quality talent. Mimos is working with its partners to bring back the interest [in these subjects]."

Imran says MDEC started giving talks and distributing booklets on career choices in the ICT industry way back in 2007. However, it soon realised that this may not be the best approach.

"It did not help much because it was a one-off thing. We needed to follow up with the students to help them find the right career path," he adds.

MDEC found a better approach after consulting with the MoE. Schools were provided with career counsellors to help guide the students and parents. Unfortunately, they did not have sufficient information on the ICT industry.

"So, we did a one-day session with the career counsellors, district by district. We gave them information on the jobs available in the industry and introduced a career counselling kit that we developed. It provided material on the jobs available, the education path required for those jobs and even salary information," says Imran.

To provide more insight into the industry, MDEC gets its partners — some of the 3,800 MSC-status companies — to give industry overviews. It also makes sure that the counsellors impart to the students what they received from the sessions and collects their feedback for reference.

The baby steps MDEC has taken have evolved into a more comprehensive programme to raise students' awareness of ICT careers. This year, MDEC is starting e-aspirasi, an experiential learning initiative. Selected children are put through boot camps that give them exposure to skills such as programming and coding.

"Of course, you won't see the outcome immediately. But I think it will definitely have some bearing on the future. We have structured the programme in a way that there are activities throughout the year until the students sit for their SPM. When they apply for university, we hope they will consider ICT as a career option. We can't force them, but we can guide them through experience and right knowledge to make that decision," says Imran.

THE CASE WITH HIGHER EDUCATION

With the pace of technological advancements, institutions of higher learning have the responsibility of preparing students for jobs that may not even exist yet. And organisations such as MDEC are playing their part to smooth the process.

MDEC starts at the technical vocational education and training (TVET) level, where a modular diploma in digital technology is introduced. "Usually, the students spend three years at the polytechnic and six months in the industry. With this modular framework, we map the curriculum to suit the skills required by the industry," says Imran.

There are three parts to the modular diploma. The first is the industry's curriculum, which is embedded in the core components that students are taught. The second is a six-month or one-year work experience in the industry. And the third is case studies provided by the industry for the students to work on.

"Since its implementation, we have had very positive support from the industry. We are targeting about 1,000 students to be enrolled in the polytechnics by the end of the year. But as we speak, we have close to 1,100 students involved in this programme," says Imran.

In universities, MDEC has taken multiple initiatives, including training the lecturers. Based on the demand for the skillsets, lecturers are trained by industry professionals to impart the right knowledge to the students.

"Intel has a design centre in Penang with almost 1,500 engineers. The design centre is one of Intel's 10 design centres in the world where they design chips from scratch. Intel was kind enough to share its resources to train our university lecturers in specific programmes, which are brought back to the universities for the students," says Imran.

MDEC also hosts competitions and hackathons for university students. It used to hold upskilling boot camps for university students after they finish their degrees, but this was discontinued after TalentCorp took over.

MDEC is looking into graduate employability. Last year, Gartner and MSC Malaysia conducted a graduate employability study to identify the most preferred universities of local ICT companies. The study found that the top five were Multimedia University, Universiti Tunku Abdul Rahman, Universiti Malaya, Universiti Sains Malaysia and Universiti Teknologi Mara.

"We shared this information with the MoHE and discussed what could be done with it," says Imran. "We are aware there are limitations — the top universities may be producing quality graduates, but may not be able to produce the numbers needed. On the other hand, the lower-ranked universities may be able to do so. So, what can be done to improve the situation?"

Although MDEC is studying the challenges faced by lower-ranked universities, its priority remains ramping up the number of quality graduates produced by the higher-ranked universities to meet industry demand.

Companies sometimes use different names for the same job description. This may lead to confusion when the ICT graduates are job hunting as they may not know that they have the qualifications for the job advertised.

In 2010, MDEC undertook a study to establish common terms of reference for knowledge workers, ICT sector employers, institutions of higher learning and government planners. Its findings were published in a book, The Skills Competency Matrix (SCM).

"The book is like a bible for the ICT industry in terms of what jobs are available in the market and the specific skills required. We engaged with almost 250 companies, looked at all the jobs they had, collected the job descriptions and mapped them together," says Imran.

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THILLAI (SAM FONG / THE EDGE), IMRAN (HARIS HASSAN / THE EDGE), THIAGARAJA (SHAHRIN YAHYA / THE EDGE)

KENNY YAP/THE EGDE

(Seated from left) Ambika and Juliana of Biji-biji Initiative with its handbags made out of discarded seat belts

It has been difficult to find Malaysian companies that have embraced this concept, but *Unlisted & Unlimited* featured one earlier this year. Rentwise Sdn Bhd, an independent lessor of IT equipment, seems to have the right idea. The company specialises in Green IT, which includes making IT life cycles more sustainable, ensuring that equipment is retired and disposed of properly while maximising equipment recovery values and resolving data security concerns.

CEO Leanne Ooi says Rentwise refurbishes machines, restoring them to as-new condition by replacing the parts that are not working properly and giving the machine a thorough cleaning. The company's goal is to prolong the life of machines before they are ultimately retired and sent for recycling.

Although refurbishing may sound like a lot of work, it actually takes less energy than tossing out the machines and building new ones. "Building a computer needs plastics, which come from fossil fuel as well as metals such as aluminium. When you combust fossil fuel, it pollutes the environment. When you mine minerals, it also pollutes," says Ooi.

When it is time to retire the machines, Rentwise sends them to one of its business partners to do the job. The machines are then reduced to their elements, which go back into the supply chain, thereby reducing the need to continually mine and extract new materials.

Rentwise is an exception. To a large extent, Malaysia has been slow to catch on to the opportunity presented by the circular economy. However, in Singapore, there is already a movement towards it.

The Sustainable Manufacturing Centre and the Advanced Remanufacturing and Technology Centre have been working with companies on remanufacturing in the city state for the past few years. The island nation now has more than 100 companies involved in waste collection and sorting, waste treatment facilities and recycling technologies and plants.

Eugene Tay, founder of Circular Economy Singapore and president of the Sharing Economy Association (Singapore), says in an article for online magazine Eco-Business that for the circular economy to succeed, governments need to get on board. "Governments should set the direction and implement policies that reduce incineration and landfilling of waste, build resilience on materials and resources, and create new job opportunities. Regulations such as extended producer responsibility and minimum recycled content could be introduced."

Extended producer responsibility is an environmental protection strategy to reach an environmental objective of a decreased total environment impact of a product by making the manufacturer responsible for the entire life-cycle of the product, including the take-back, recycling and final disposal. Minimum recycled content states that every product, material, good or supply must have its percentage of post-consumer recycled-content material certified by the supplier.

So, where do the opportunities lie? The Ellen MacArthur Foundation has identified four building blocks that will foster a more circular economy.

First, circular product design and production. "A key feature of a circular economy is to be restorative and regenerative by design. The recovery of materials and products is not only addressed at end of use, but is enabled at the design level [such as the choice of materials or design for disassembly]," it says.

Circular product and process design requires advanced skills, information sets and working methods that are not readily available today, it adds. Manufacturers should specify the purpose and performance of the end-products, more than that of input materials. They should also favour pure materials in their production process since they are easier to sort out at end of life.

Other areas important for economically successful circular design are standardised components, designed-to-last products, design for easy end-of-life sorting, separation or reuse of products and materials, and design-for-manufacturing criteria that take into account possible useful applications of by-products and waste.

Feedback mechanisms should be developed between design and end-of-use activities. Business models that move from ownership to performance-based payment models are instrumental in translating products designed for reuse into attractive value propositions, the foundation says.

By prioritising access over ownership, these models drive the shift from consumers to users. Companies with significant market share and capabilities along several vertical steps of the linear value chain could play a major role in driving circularity into the mainstream by leveraging their scale and vertical integration.

To create value from materials and products after use, they need to be collected and brought back. Reverse logistics and treatment methods allow those materials to get back into the market. They will include delivery chain logistics, sorting, warehousing, risk management, power generation, and even molecular biology and polymer chemistry.

With cost-efficient, better quality collection and treatment systems and effective segmentation of end-of-life products, the leakage of materials out of the system will decrease, hence supporting the economics of circular design.

Collection systems must be user-friendly and located in areas accessible to customers. End of life specialists must be capable of maintaining the quality of the materials so they can cascade through diverse applications. The "downstream" applications should, for example, flow in ways that optimise nutrients and value recovery before finally returning the nutrients to the soil. **E**

Get industry certification to demonstrate competency

MDEC also conducted a survey to solicit the latest data points from the ICT industry to update the information. Some companies even volunteered their resources by granting face-to-face interviews to provide an in-depth look at the challenges of finding the right talent and verifying the critical technical and soft skills required for each job.

As a result, *SCM 2.0* was published last year, with new elements such as certification, salaries and job demand information, in addition to verifying and updating the existing information. The book is available for free on MDEC's website.

ADDING VALUE TO INCREASE EMPLOYMENT POTENTIAL

Since the industry requires talent at the intermediate and advanced levels, what should those at the entry level do to make sure they are employable? Thiagaraja says they should upgrade their skillset.

"When talking about IoT, everything is integrated. You must be at least at the intermediate or advanced level in managing hardware, managing databases and even networking. People need to look at their current skillset and raise their game if they want to be part of the field. When you have the skills, you will be able to ask for higher pay as you are producing more value for the organisation," he points out.

Thiagaraja says one of the easy ways to increase one's competency is to get industry certification. "For example, you would already have an ICT degree from a local public or private university — you are at the entry level. Then, you can take up certifications that the industry recognises."

ICT is a vendor-driven industry and industry-based certifications are recognised. Vendors such as Microsoft, Oracle, SAP, CISCO and Huawei are all offering their own industry-based certifications. Thiagaraja says getting such certifications will greatly enhance one's employment value.

"By obtaining industry-based certifications, you have demonstrated certain skillsets and knowledge. It shows that you are capable of doing the job. This will make you a highly sought-after talent," he adds.

Meanwhile, MDEC, in collaboration with the Performance Management and Delivery Unit (Pemandu), has conceptualised the Malaysian Professional Certification (MyProCert) programme — a strategic intervention aimed at upskilling the current workforce, says Imran.

"We are promoting almost 90 skillsets for the ICT industry, covering multiple domains. Individuals can enrol for the programme at a considerably cheaper rate.

"If one wants to pursue an SAP certification for a particular module, say, finance control, the five-week module can cost up to RM28,000. But we approached the SAP Academy directly and negotiated the price. We managed to reduce the cost to RM18,000. On top of that, we give out cash rebates to those who obtain the certification."

HIRING AND RETENTION

For some companies, finding the right talent may be easy. But that does not necessarily mean they are able to afford them.

"This is not an easy problem to solve. Small and medium enterprises need to understand there is no point looking at mediocre talent who are not optimal for your business. You must get the right quality talent with the right experience, and this kind of talent comes with a price tag attached," says Imran.

He also says that companies need to know how to attract the right talent. While a good salary is important to the millennials who make up the workforce, it is not the only thing. They also want things like flexibility, career enhancement opportunities and being a part of the organisation's decision-making process.

"For these people, it is about engagement. They want to be involved and have their views taken into consideration. But of course, you cannot compromise too much on the salary. If you offer way below the market price, you will not be able to hire top quality talent," he adds.

Mimos' Thillai Raj says the problem of expensive talent stems from companies opting for foreign knowledge workers over local talent. "If you go to software companies in Malaysia, you will see that half of the workers are actually from India."

According to MDEC's study, 43% or 10,819 of the foreign knowledge workers employed in the country are from India. Thillai Raj says companies need to bite the bullet and train local talent instead of taking the easy way out. Mimos hires fresh graduates with the intention of training them for a year to make sure that they are industry-ready.

"After a year of training, we approach industry players to see if they need extra hands. If they do, we are more than happy to supply them with the talent we have trained. This is our way of doing corporate social responsibility to help the whole ecosystem because no one else wants to invest in training fresh graduates," he says. **E**