

KOSEN STARTUP AUTOMATES INSTRUMENT INSPECTION

Kosen, or institutes of technology, form an educational system particular to Japan that provides university-level vocational education to students once they graduate from junior high school. A startup that was launched at one such school is now implementing digital transformation at workplaces in many industries.

Industrial worksites use a dizzying mix of analog and digital instruments: thermometers, pressure gauges, power meters, water meters, flow meters, and so forth. Those instruments require visual checks and inspections, with workers in many cases needing to examine them numerous times a day, and sometimes late at night or on holidays.

IntegrAI is a startup working on applying digital



Sodoo and his team entered KOSEN-DCON with the NITNC Pre-Lab Team and won first prize for their product MATERAI, the prototype for IntegrAI.

transformation (DX) to that burdensome task. The company has developed a system that automates data recordings and provides notifications of anomalies. It does so by using AI to read numerical values from video footage provided by cameras mounted to the instruments. The startup was founded by a teacher and Mongolian international students at the National Institute of Technology, Nagaoka College (NITNC,

called “Nagaoka Kosen” for short in Japanese).

Kosen, or institutes of technology, form an educational system particular to Japan whose purpose is to train engineers with practical and creative skills. The schools accept junior high school graduates and provide a professional education via a five-year program equivalent to senior high school and undergraduate engineering courses. There were 57 public and private *kosen* in Japan as of March 2023. Each school focuses on its own specialty in cooperation with its local community.

Being located in Niigata Prefecture in north-central Japan means that NITNC is surrounded by a thriving agro-industrial area. The school carries out many projects to solve local companies’ technological problems, and students join those projects from their first year in the school. The idea behind IntegrAI’s product came from a company president who found checking instruments to be a burdensome chore. Odonchimed Sodtavilan (Sodoo), a student from Mongolia, developed a system that uses AI to read analog meters and notify workers of the values via smartphones and other devices. Another Mongolian student, Bayarbat Nomunbayasgalant (Nomuha), later joined the project. Together they won the first prize at the 2019 KOSEN Deep Learning Contest (KOSEN-DCON).

In 2020, they used the prize money to establish IntegrAI. KOSEN-DCON’s follow-up support for the winners facilitated a smooth start for the company. YANO Shohei, a teacher at NITNC, said,

“Even we didn’t realize this technology’s true value. But the staff at KOSEN-DCON recognized the high



AI automatically reads and records analog and digital meter values. The user can freely configure settings such as standard values to receive a notification when there is an anomaly.

demand for applying DX to decades-old equipment and strongly encouraged us to start a business.” Nomuha added, “The KOSEN-DCON people helped us with the startup paperwork. Without them, we wouldn’t have made the decision to start the business.”

The IntegrAI product is used in company factories, as well as to manage the local government’s storage of COVID-19 vaccines, and to monitor fuel data for the Japan Aerospace Exploration Agency (JAXA). One potential customer is now considering using IntegrAI to manage highway electrical systems.

Sodoo said that *kosen* are appealing because “they offer a great environment for using your hands. When I was there, I was making something every day in Mr. Yano’s lab. I don’t think we would have been able to develop the IntegrAI product without that environment.”

The Japanese government intends to encourage the creation of more such startups from *kosen*. The government came out with the Startup Development Five-Year Plan in November 2022, which calls for stronger education in entrepreneurship at such schools. The Ministry of Education, Culture, Sports, Science and Technology has included 6 billion yen (around 44 million dollars) in its proposed supplementary budget for fiscal 2022 to cover the cost of improving the educational environment geared toward generating startups at *kosen*.

Yano said, “From a young age, the students learn close by to real worksites so that they can then innovate. That’s what *kosen* can offer.” Many startups like IntegrAI have emerged from such schools. Through practical study, we can expect those educational institutions to steadily provide technology that benefits real-world workplaces.



IntegrAI’s founding members. From left: founder Odonchimed Sodtavilan, representative director and NITNC teacher YANO Shohei, and CEO Bayarbat Nomunbayasgalant.



The IntegrAI system is ready to go after simply attaching a camera to an instrument.

