Digital conversion era ahead for our industry

by Peter Marriott, Sales Manager, Henry Simon UK

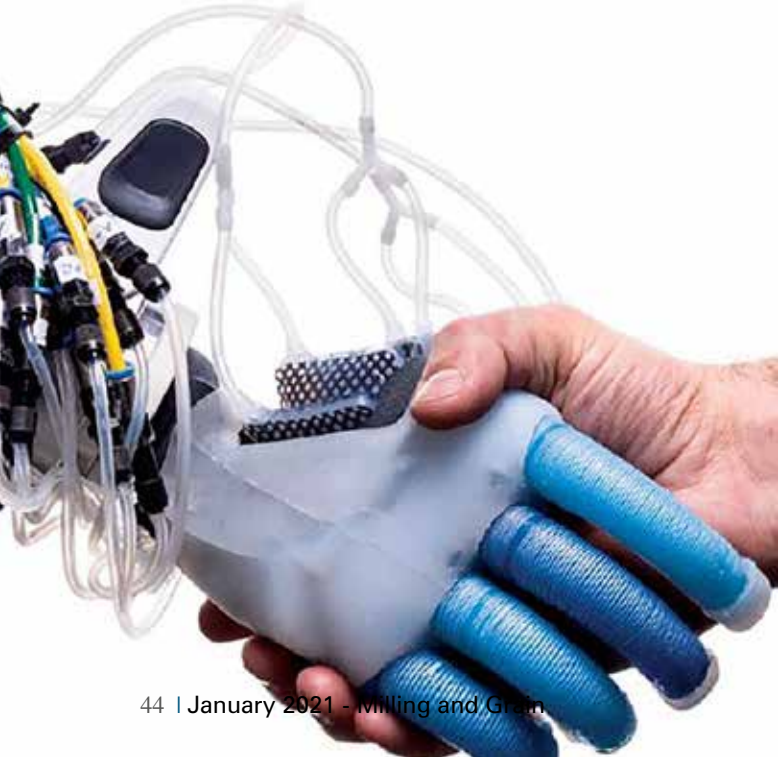
Peter Marriott, Sales Manager, Henry Simon UK looks forward to a future of digital development that goes beyond Industry 4.0 where 'big data' and 'The Internet of Things' provide more light-out manufacturing in the grain and milling industries

Industry 4.0 was first announced in 2011 at the Hannover Exhibition in Germany and until now has brought serious changes to industry.

After the historical development steps of mechanisation, mass production and automation, today the new era has focused on higher productivity with digitalisation in industrial processes.

The industrial development had been almost singularly driven by web-based technologies in recent years. And within the digital conversion, we started to hear about new technological terms like 'big data', IoT, cyber security, machine learning and artificial intelligence, etc.

These terms are actually the fundamentals of a new generation of industrial systems. In this article, I hope to explain how we can benefit from them in industrial applications, by focusing on their definitions, principles and examples.



Internet of Things (IoT)

IoT network basically connects the physical world's objects to each other in the web environment.

Today approximately six billion devices are connected to the web, whereas it is expected to raise up to 22 billion soon - with 5G technology.

IoT is expected to allow machines, systems and even plants to connect and communicate with each other for an integrated process management.

The new generation of controlled irrigation systems is an interesting example of IoT, with automated operation and process optimisation in agriculture. These systems carry out the irrigation process with real-time monitoring of the soil humidity by in-ground sensors. Moreover, these devices can receive the weather forecasts by wireless network connection and then schedule the irrigation periods accordingly.

Data Engineering

Today, many industrial devices are able to record their operating and processing data. This raw data stack can actually be analysed further to get a piece of meaningful information using data engineering methods. This gives us important tips to improve our processes and develop new systems such as: data collection; data analysis; modelling; machine learning and decision making systems with AI.

As the principles of data engineering are described above, they will provide a real insight for us to develop the artificial operating systems of the future.

Machine learning

Machine learning is a category of algorithms that allows software applications to become more accurate in predicting outcomes, without being explicitly programmed.

In other words, new generation machines will able to make predictions based on the learned data, to optimise their operating

conditions themselves. Machine learning algorithms are the basics of new programming methods in industry, which are expected to bring a higher self-managing ability for machines and systems.

As an example, silo systems are used to store grains under optimum conditions. Today, temperature and humidity values can be measured in silos to sustain the optimum storage environment. Imagine if they could learn to adapt themselves according to the changing ambient conditions?

Machine learning examples can be extended for a very wide range of applications in all industries.

Artificial Intelligence

Artificial Intelligence is all about trying to make machines or software mimic and eventually, supersede human behaviour and intelligence.

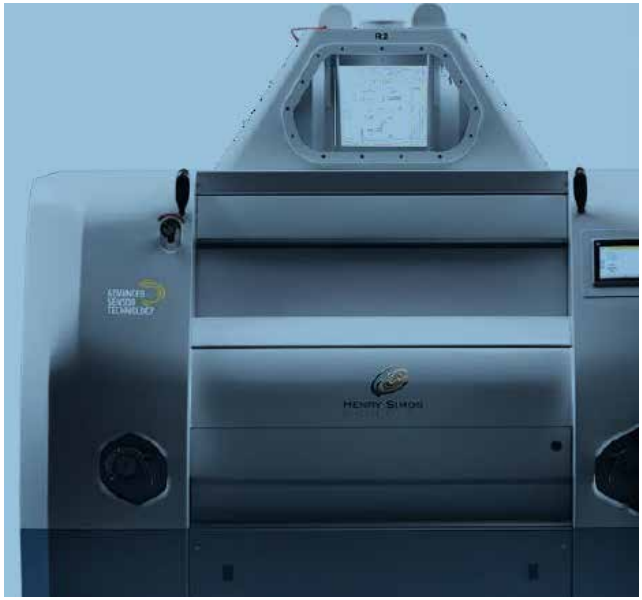
Industrially, AI operating systems (AIOS) are expected to provide advanced management and operation abilities, with minimum intervention and maximum productivity advantages at the same time.

We have already started to talk about tomorrow's 'lights out' manufacturing plants and it will be interesting for us 'see' all together how the grain milling industry will be affected by these technological developments. Robots are evolving in order to take on autonomous and flexible duties. Soon we will have industrial robots that can learn, decide and even interact with people.

Sensor technologies

At Henry Simon Milling, we have dedicated ourselves to develop intelligent milling systems.

For the first step of the digital conversion, we have implemented Advanced Sensor Technology™ which brings higher reliability,



better operational safety and consistent quality in milling process.

In this technology, sensors are responsible for real-time tracking of the machine's operating status and environmental conditions, to detect any fluctuation during the operation.

HSRM Roller Mill has been equipped with 12 different special sensors (Main Roll Temperature, Ambient, Motor Load, Feed Roll and Main Roll Rotation, Vibration - PMD, Air Pressure, Stock Level, Hopper Clog Sensors etc). And the new HSQP Plansifter and HSPU Purifier will be also be available with Advanced Sensor Technology.

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