

## Developing a leading Edge with PAT

29 September 2022

**Quickly delivering high-quality products at competitive prices with maximum efficiency is every manufacturer's dream. This can be achieved by leveraging a robust, data-driven control strategy, such as Process Analytical Technology (PAT) combined with Edge capabilities. Using an optimised setup, businesses can benefit from a holistic and dynamic process understanding that can be used to improve and intensify operations.**

*Martin Gadsby, Director at Optimal Industrial Technologies, looks at how PAT and Edge computing go hand-in-hand in well-designed digitalisation strategies*

The vision of PAT as a tool to design, analyse and control manufacturing through timely measurements to deliver quality products originated decades ago. While its concepts are not new, more and more enabling technologies to support this framework are being released and refined. In particular, the objectives of PAT align with current Smart Manufacturing and Industry 4.0 strategies and share the common goal of gathering data and deriving the most value from it to generate knowledge.

As a result, PAT is largely benefitting from the latest advances in industrial automation, especially Edge and Cloud computing. A successful PAT-led production system should be able to support both time-critical decision making and deferrable in-depth data analytics. The first is key to adjusting processing conditions in real time to meet quality targets. Conversely, the second supports quality auditing as well as complex tools, such as chemometric or multivariate analysis (MVA) models. These are essential to supporting long-term improvements by storing

datasets, identifying patterns and trends, predicting future outcomes and producing other information used to drive efficiencies within the business.

### **Bilateral interactions**

Edge computing can help accommodate high-speed communication by processing time-sensitive information close to its source, for example using smart and cogent sensors or strategically located virtual machines. Simultaneously, it offers a filter to transmit only what is necessary to the Cloud or on-premises for advanced, Big Data mining and repository functions.

While PAT frameworks can benefit from the Edge, the inverse is also true. More precisely PAT can help businesses set up forward-looking Edge computing applications by providing the backbone to create a suitable network infrastructure. In addition, a centralised PAT knowledge management platform, such as synTQ, can help businesses gain a comprehensive process overview. This can combine, integrate and visualise pieces of information from across distributed workloads that are taking place dynamically across devices, edge systems, Clouds and other data centres.

As future applications of industrial automation and PAT become more advanced, it will be possible to further enhance both real-time and advanced analytics capabilities across the network infrastructure. In particular, manufacturers will be able to bring their operational technology (OT) and information technology (IT) domains closer and closer together, benefitting from ever more accurate representations of manufacturing line and key operations.

By partnering with a leading PAT and process control specialist, such as Optimal, businesses can equip their facilities with state-of-the-art smart solutions. These can

help maximise productivity, efficiency and product quality while offering minimised lead time and quick return on investment.



## About Optimal Industrial Technologies Ltd

Within the Optimal group, we have more than 30 years' experience in the automation and optimisation of control and data management systems for the food, chemical, pharmaceutical, biotech, life science and other process industries.

The demands being placed on manufacturers in relation to getting products to market sooner, minimising development and production costs together with increasing product quality and business sustainability are ever increasing. Our primary aim is to deliver measurable improvements in all these target areas.

In addition to practical automation and system integration expertise, Optimal Industrial Technologies has also developed the world-leading PAT Knowledge Management software platform – synTQ® – which is used by over 60% of the world's leading pharmaceutical and biotech companies, and is now being adopted by other process industries. synTQ has been a proven enabler of QbD via PAT by significantly increasing productivity and quality, while reducing waste, time to manufacture and time to market for batch and continuous processes.

### Press contact:

#### Optimal Industrial Technologies

Martin Gadsby

Vice President

Tel.: +44 (0) 1454 333 222

[mgadsby@optimal-ltd.co.uk](mailto:mgadsby@optimal-ltd.co.uk)

### PR agency:

#### DMA Europa

#### Chiara Civardi

Progress House, Great Western Avenue, Worcester,  
WR5 1AQ, UK

Tel.: +44 (0) 1905 917477

[chiara@dmaeuropa.com](mailto:chiara@dmaeuropa.com)

[news.dmaeuropa.com](http://news.dmaeuropa.com)