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ASIA EDITION

Ã¢â?¬Å?Adapting smart manufacturing represents great potential for pharmaceutical industry as a wholeÃ¢â?¬Â•

July 1, 2024 | Opinion | By Ayesha Siddiqui

Rockwell Automation provides smart solutions for manufacturing processes. Marcelo Tarkieltaub, Regional Director for Southeast Asia at Rockwell Automation, discusses the company's smart solutions for the life sciences industry, challenges in implementing smart factories, and factors driving the adoption of digital technologies in the sector.



What's been Rockwell Automation's role in driving smart manufacturing initiatives within the life sciences sector, particularly in the Asia Pacific (APAC) region?

We are a global leader in digital transformation, playing a pivotal role in advancing smart manufacturing. In the life sciences sector, smart manufacturing is crucial for enhancing efficiency, ensuring compliance, and improving product quality, which aligns with our mission to drive innovation and operational excellence.

The APAC region is a rapidly growing market for the life sciences sector, characterised by increasing demand for innovative healthcare solutions and stringent regulatory requirements. The pharma market in this region is expected to grow from almost $70 billion in 2022 to nearly $153 billion by 2032, with Singapore being one of the leading biomedical and pharmaceutical hubs in APAC.

Meeting the needs of complex manufacturing processes, while remaining compliant with regulations, businesses are turning to advanced manufacturing automation technologies. Automation enhances precision, efficiency, and scalability, crucial for innovative healthcare solutions. It ensures compliance with global regulatory standards, minimising human error and maintaining consistent product quality. Additionally, automation supports faster time-to-market and cost-effective production, essential for staying competitive in the rapidly growing APAC pharma market.

We offer a suite of advanced technologies and solutions that empower the life sciences industry. These include IoT-enabled devices, advanced analytics, and comprehensive automation platforms such as the FactoryTalk PharmaSuite. Developed specifically for the life sciences industry, this MES solution leverages IoT and an open-content architecture paired with an intelligent upgrade engine, to provide a robust system for growth in both batch and discrete processing. Deploying this solution results in automated data collection and the ability to review exceptions in real-time.

Pharmaceutical manufacturing has been characterised as a late adopter of digital technologies compared to other industries. What are your thoughts on this? How does the company view the potential for digital transformation within the pharmaceutical sector? Will we see more smart manufacturing in the sector moving forward?

The complexity of pharmaceutical production processes and the high stakes involved in product quality and patient safety have made manufacturers cautious about implementing new technologies. However, this is changing as companies recognise the benefits of digital transformation, such as improved efficiency, enhanced data analytics, and better compliance tracking. Emerging technologies like AI, IoT, and blockchain are now being increasingly integrated to streamline operations and ensure robust quality control.

In the 9th annual State of Smart Manufacturing Report, about 95 per cent of respondents – encompassing businesses of all sectors, including life sciences – are using or evaluating smart manufacturing technology, a jump from 84 per cent in 2023. Given that quality and compliance is of the utmost priority within the pharmaceutical manufacturing industry, it is safe to say that adapting smart manufacturing represents great potential for the pharmaceutical industry as a whole.

We will see an increased adoption of smart manufacturing moving forward as the industry requires meeting the needs of more complex manufacturing processes to develop specialised medicine. The adoption of more technological advancements is instrumental in aiding organisations and manufacturers within the industry to regulate and manage their overall cost of production as well.

What are some of the main challenges and opportunities you foresee in serving the evolving needs of life sciences manufacturers especially in APAC, and how do you prioritise strategies to address these?

Amid the developments in complex manufacturing processes and new technologies, the pharmaceutical manufacturing industry is now looking at several challenges in the evolving needs of the manufacturers. One of them is the importance of adhering to the global level of quality control and standards set by regulatory bodies like the ASEAN Pharmaceutical Regulatory Policy. Other challenges include supply chain disruptions within the pharmaceutical sector, retaining the right talents with combined expertise in specialised areas like biopharmaceutical engineering and technological savviness, as well as maintaining cost efficiency while ensuring product quality.

Several strategies can be prioritised within the industry in addressing these challenges. Real-time monitoring and predictive analytics can be adopted to ensure quality is always achieved, by having process or plant digital twins in place so that data can be observed and used in real-time. Utilising IoT in smart manufacturing solutions enables supply chain visibility, enhancing resilience and responsiveness should there be any supply chain disruptions in the future. Adopting automated solutions could reduce manual labour, reducing production costs and improving efficiency in the long run.

Data privacy is paramount in the pharmaceutical industry. How does Rockwell Automation ensure robust data privacy measures are in place to safeguard sensitive information, particularly in the context of digital transformation initiatives within the sector?

Rockwell Automation helps provide robust data privacy by implementing comprehensive security frameworks and advanced encryption technologies. Our solutions include secure data storage, access controls, and continuous monitoring to prevent unauthorised access and data breaches. The pharmaceutical industry is vulnerable to cyberattacks, like all industries. We use the NIST Cybersecurity Framework to address five categories of effective defence: Identify, Protect, Detect, Respond and Recover.

Looking ahead, what are your key priorities and strategic initiatives in advancing smart manufacturing capabilities for life sciences clients, and how do you anticipate these initiatives evolving in the coming years?

One of Rockwell Automation's key priorities is to assist businesses in various sectors – including the life sciences industry – in their journey toward transforming their business digitally. Recently, Rockwell Automation expanded its collaboration with NVIDIA, driving the use of AI in autonomous mobile robots (AMRs) to enhance performance and efficiency. This is a continuation of Rockwell Automation's cooperation with NVIDIA in accelerating a next-generation industrial architecture. This is excellent news for the pharmaceutical manufacturing industry, as it will accelerate the adoption of smart manufacturing

solutions within the industry.

As technology continues to evolve, Rockwell Automation remains committed to integrating the latest advancements into its solutions. With increased adoption of digital twins, greater use of predictive maintenance, and deeper integration of AI and IoT devices, Rockwell Automation aims to drive innovation in precision medicine and ensure seamless, secure, and efficient manufacturing processes in the life sciences sector.

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