Internet of Things (IoT): The New Prescription for Pharmaceuticals Manufacturing and Supply Chain

The application of Internet of Things (IoT) in the pharmaceutical industry will be the next phase of growth for pharma companies. IoT refers to the networking of physical objects through the use of embedded sensors, actuators, and other devices that can collect or transmit information about the objects. Advances in wireless networking technology have made it possible to collect data from these sensors almost anywhere at any time.

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Imagine running a pharmaceuticals manufacturing company. You are not only managing the complexities of the batch manufacturing process, but also looking at plugging all gaps in your logistics chain, and ensuring complete quality to your customer. Although industrial automation and control technologies are well established in life sciences manufacturing facilities, integral information on real-time status of equipment is still not readily available to the management to take timely decisions. Moreover, stringent CGMP (Current Good Manufacturing Practice) regulations expect top quality compliance across all your equipment.

A rising number of biologics drugs (temperature-sensitive, short shelf-life drugs) in the market would mean that you have to ensure temperature consistency and loss-free shipping from the source to the point where the drug is administered. Operating costs run high due to expensive cold chain logistics, and also because of losses due to bad handling.

The challenge is accentuated in the manufacturing and distribution of generic drugs, which constitute up to 80 percent of today's pharma market. To handle the stiff competition in the market for generics, you also need highly developed logistics capabilities with the highest efficiencies at the lowest cost.

Warehousing, a vital component in the manufacture of pharmaceuticals, is costly, and its efficiency and quality are crucial for the company's survival. Many companies choose to manage the processes internally, given the sensitive nature of the products. A McKinsey study says that warehousing accounts for 95 per cent of all pharma logistics costs.

Today, pharmaceutical companies have a compelling opportunity to adopt and profit from the game-changing technological advancement called the Internet of Things (IoT) that promises to fix all the aforementioned gaps. In an IoT environment, every 'thing' is equipped with a sensor that allows it to intelligently communicate and interact with other objects and systems within the IoT ecosystem. The IoT environment helps pharmaceutical companies to automate and revitalise their manufacturing and supply chain management operations.

IoT extends visibility into every area of the business from development through manufacturing, transport, distribution, dispensing, and consumption. On the shop floor, real-time data from sensors will allow visibility across all areas of work, and result in improved productivity, efficiency, reduced cycle time and manufacturing costs.

Smart warehouse management systems enabled by IoT integration will bring in increased visibility, provide real-time data to track and report inconsistencies (for example, storage temperature), and ensure that the right data is available at the right time to enable the right people to act when it truly matters. In logistics, tracking drug inventory movements in real time can save billions of dollars. Smart pharma packaging can help ensure that

shipments and medications are accurately tracked, and the supply chain remains fluid, efficient, and cost-effective.

According to IDC, there were 9.1 billion IoT units installed in 2013, which is predicted to increase to 28.1 billion in 2020. In such a fast-changing world, connected equipment, men and material tracking, sample lifecycle management, smart packaging, and cold-chain monitoring are among the top IoT applications suited for the pharmaceuticals industry. Investing in these transformational technologies comes with its challenges. Below are some recommendations and best practices for pharmaceutical companies to fully benefit from their IoT integration.

- Invest in supportive IoT infrastructure and be future-ready.
- Invest in IoT-based security solutions because security is paramount and workarounds are costly.
- Focus on robust change management to make sure people, processes, and responsibilities adapt seamlessly and make the transition successful.
- Think big, start small, fail fast, and scale quickly.
- Make sure that key decision-makers are on board and success criteria in project lifecycle are defined early.
- Perform pilots, establish business benefits through proofs-of-concept (POCs), employ Agile methodologies, choose suitable partners, and leverage expert teams to effect this digital transformation.

Looking ahead, the advances in digital technologies, ubiquity of mobile computing, dominance of social media, and a growing portfolio of smart products are sure to bring real-time actionable intelligence. Enterprises must constantly use emerging technologies to innovate, stay relevant, constantly hone competitiveness and make profits. The risks of doing nothing must be evaluated. The time for pharmaceutical companies to accelerate implementation and use of IoT platforms and solutions is now. ■

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