7 SMARTEST FACTORIES IN THE WORLD

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Every year the **WORLD ECONOMIC FORUM'S GLOBAL LIGHTHOUSE NETWORK** honors companies that use Industry 4.0 and Internet of Things technologies to make their operations more efficient, environment-friendly, and lower cost.

To date 69 factories have been honored as "lighthouses" for leading the way in establishing smart operations. These smart factories show how Industry 4.0 can improve the agility of operations in responding to major market disruptions, such as the COVID-19 pandemic.

HERE ARE SEVEN OF THE SMARTEST FACTORIES IN THE WORLD

1 Alibaba (Hangzhou, China)

This fashion-and-apparel manufacturing facility utilizes cloud-based computing and IoT technologies to create an agile production system based on real-time production data. Other technology enhancements include cloud-based resourcing and cost planning, automation and robotics, and AI to maximize quality and speed up production.

2 Micron Technology (Taichung, China)

Micron's semiconductor memory manufacturing facility utilizes an integrated IoT and analytics approach to identify manufacturing variances and provide automated root-cause analysis, which reduced unplanned downtime by 30 percent. An advanced AI-based optical inspection system analyzes millions of product images daily, which are compared to their digital twin replicas.

3 Unilever (Hefei, China)

Unilever utilizes flexible automation, sensors, and cloud-based management systems across all its production, warehousing, and delivery segments, reducing order-to-delivery lead times by 50 percent and overall costs by 34 percent. AI is also used to create a more flexible, efficient, and transparent supply chain.

4 Saudi Aramco (Saudi Arabia)

Khurais is the largest smart oil field in the world, with over 40,000 sensors that monitor over 500 oil wells. Saudi Aramco relies on big-data analytics, AI, robotics, and digital twins to run its operations as efficiently as possible. Wells are equipped with smart downhole sensors, control valves, and pumps to monitor and adjust flow.

5 Schneider Electric (Lexington, Ky., U.S.)

This 60-year-old-plus manufacturing facility has totally transformed its operations with Industry 4.0 technologies. Its energy management strategy uses IoT, big data, and predicative analytics to reduce energy consumption and meet sustainability goals. Augmented reality, remote monitoring, and predictive maintenance are used to streamline operations, boost efficiency, and reduce overall costs.

6 GlaxoSmithKline (Ware, U.K.)

This pharmaceutical manufacturing facility relies on neural networks, advanced analytics, and other Industry 4.0 technologies to improve quality and streamline production. Line speeds have improved by 21 percent and OEE (overall equipment effectiveness) improved by 10 percent. GSK has also combined digital twins, AI, and deep-learning image recognition to detect quality defects and optimize cycle time monitoring.

7 Bayer Pharmaceuticals (Garbagnate, Italy)

Bayer Pharmaceuticals utilizes machine learning, AI, big-data analytics, and digital twins to optimize the quality, efficiency, and cycle times at this facility in Italy. Augmented reality devices are also used to identify the best way to switch product lines efficiently and reduce changeover times. Process improvements are more transparent and accessible to employees on the factory floor.