



HOW TO TRANSFORM YOUR EXISTING PLANT TO A SMART PLANT WITH OPTIMAL EFFORT, INVESTMENT, AND ROI

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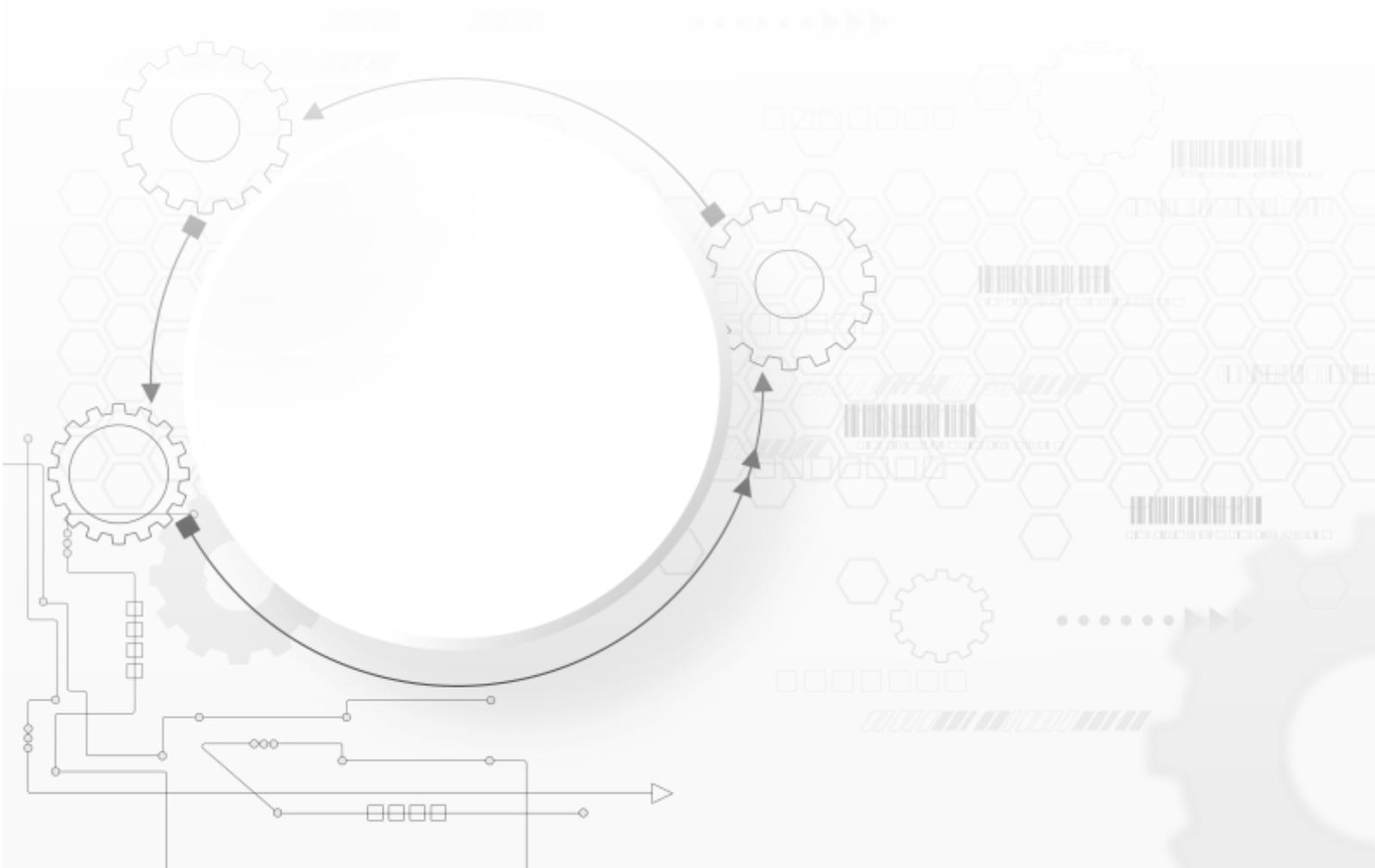
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WHY SMART PLANTS?

Emerging consumer demands have reshaped the way organizations do business. To cater to evolving tastes, retain customers and stay relevant, companies need to thoroughly review their existing operational practices and policies. They must embrace the automation, Cloud computing, and connectivity-driven changes that represent the fourth Industrial Revolution or Industry 4.0.

Manufacturing, which accounts for about 16% of the global GDP, stands to gain enormously from this movement. Vertical leaders today are increasingly proactive in their search for technology solutions that can streamline their operations and overcome the myriad challenges posed by legacy infrastructure. These challenges include obsolete, closed, proprietary communication protocols, a visible lack of effective sensor integration on the factory floor, and even the current maintenance and upgrade paradigms, which are essentially reactive and retroactive in nature.

With the emergence of new players in markets that were historically dominated by traditional manufacturers, businesses are implementing key technology enablers of Industry 4.0 to stay competitive. This is expected to drive up hardware spending on the Internet of Things (IoT) to nearly \$3 trillion by 2020 and investment in the Industrial Internet of Things (IIoT) to more than \$60 trillion by around 2030. Investments in artificial intelligence (AI), Cloud and fog computing, a viable convergence of information technology (IT) and operational technology (OT), supervisory control and data acquisition (SCADA), preventive maintenance (PdM), and prescriptive maintenance (RxM) are also seeing steady growth.

For manufacturers, the main challenges in going digital, crop up in those cost and effort-intensive first steps, which are often deemed extremely risky. But while the initial investments may daunt some manufacturers, the overwhelming benefits of unmatched productivity uptime, efficiency, and precision, lead to a healthy eventual ROI.

Approximately 80% of organizations had a more favorable view of IoT in 2016 than in 2015 and early birds will soon be seeing their investments bear fruit. AT Kearney predicts that organizations will realize nearly \$2 trillion in productivity improvement and \$177 billion in cost reductions through IoT. And PwC forecasts that industrial companies stand to achieve efficiency and cost savings of more than 20% by deploying IIoT technology.

The metrics say it all – organizations should create manufacturing facilities that are smart and self-diagnosing, with enhanced connectivity and real-time insights, to retain a competitive edge.

Figure 1 shows the industries that have already gained from 'smart' industrial processes.



Figure 1





Smart Plants Driving 'Cyber-Physical' Connectivity in a Smart World

Industry 4.0 is a movement towards connecting embedded systems and smart production facilities to converge industry, business, and internal functions and processes. Simply put, the model introduces the concept of 'cyber-physical' connectivity – an intersection of software-enabled solutions with cognitive, interconnected machinery – to create a smart plant. Such smart plants could add up to \$1.5 trillion in value to the global economy in five years and the next few years will be critical for manufacturers looking to make the transition to accelerated digital capabilities and business outcomes.

A smart plant will be built on systems that are characterized by: that help integrate IT and OT on a digital manufacturing platform. A smart plant leverages an effective IIoT mechanism and SCADA to deliver a seamless operational experience. Data-driven maintenance models (PdM and RxM), which ensure greater ROI by minimizing potential downtime, also play a vital role.

Individualized and consumer-centric production that helps manufacturers transform their current value proposition from mass-based products to effective and reliable data-driven aftermarket services. The data collected from smart, connected machinery can be used to measure and monitor its performance and the interactions that consumers may have with the output – a scenario which empowers businesses to reevaluate their positions vis-à-vis customer expectations and deliver enhanced value across all touch points, irrespective of geospatial or temporal constraints. These manufacturer-consumer interactions can potentially cover multiple scenarios, ranging from simple product performance alerts to services across the customer life cycle. With smart plants, on-time delivery is expected to grow by 13x, whetting both consumer and business-owner appetites.

Global consolidation of value chains involves a transparent and optimized digital thread that delivers an automated and seamless flow of processes and materials. This initiative also includes integrated planning and implementation systems, autonomous logistics, smart procurement and warehousing, and deep analytics.



THE TRANSFORMATION JOURNEY

Converting your existing plant into a smart plant requires strategic and meticulous planning and execution. To begin, a viable action plan would consist of:

Data-driven planning:

Manufacturers need to conceptualize and design an effective, data-driven action plan, one which takes into account all historical, current, and predicted outcomes at the very outset. The ultimate objective is to integrate all stages of the production process so that defects or errors can immediately be actioned, accommodated, and adjusted without any losses in uptime or wastages. This single, integrated data model, on which all participants in the manufacturing process, from design to selling, rely on, is what product life-cycle management (PLM) professionals call a “single source of truth.”

Synergy between the workforce and technology:

The human element, as expected, plays a key role in ensuring the success of the transformation roadmap. While a short learning curve and speedy adoption of new IT-OT systems would be a major objective of the plan, decision-makers would do well to ensure that the implementation process is aligned with the strengths and capabilities of existing employees to ensure a smooth transition.

Overcoming organizational barriers:

Transitioning to a smart plant involves a process of accretion. It is critical to introduce new technologies in synergy with existing, proven systems. Legacy systems are sometimes built on rigid siloes, which hinder the journey towards a connected plant ecosystem. A complex manufacturing system

demands fluidity, agility and flexibility. Strong mechanisms of information-sharing and collaboration, that avoid unnecessary hierarchies, can help achieve this. However, these mechanisms need to be integrated intelligently within the established environment.

Effective consolidation, backed up by a holistic outlook:

A holistic view of the setup helps ensure that the transformation is data- and insights-driven. Such an approach takes all the vital parameters and insights into account, before reaching a decision. While connected systems could break new ground in planning, control, and monitoring, and smart self-configuring automation systems would boost productivity, an integrated, comprehensive approach is imperative to the transition. By intelligently weaving in connectivity and analytics solutions, manufacturers can effectively consolidate and harmonize the existing setup.

Robust support tools:

The transformation journey would be incomplete without identifying and implementing robust support tools like smart dashboards, efficient sensors, and cognitive solutions. These handy tools enable centralized visibility into the operations of the connected plant through flexible, virtual hosting platforms.

Strong security measures:

While connected systems lend factories a degree of flexibility that was previously impossible, they also open up vulnerabilities that never existed. The gateways connecting IIoT devices will need to be armed with enough computing power to secure themselves against cyber risk.



THE SMART PLANT AND BEYOND

Smart factories are no longer a futuristic theory. They are very much today's reality and are steadily making their way into the mainstream. Over 75% of global manufacturers have already begun the smart plant transformation or have at least formulated it. The components of a smart plant thrive in a smart, connected ecosystem that is empowered by deep, data-driven, real-time analytics. As a consequence, machine health and productivity is not only constantly monitored and documented, but corrective action is also prescribed and implemented instantly. To the delight of businesses, devices that always function optimally, minimize downtime and losses in productivity, efficiency, and revenue. It is estimated that overall efficiency will grow over the next five years at 7 times the rate of growth since 1990.

Industry 4.0 is scaffolded by the growing availability and accessibility of connected, cognitive solutions. The myriad developments in the field have helped drive down cost, increase ROI, and enhance gains in productivity possible through this transformational journey. Smart plants will therefore only grow in popularity across industries and geographies alike.

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