Technologies to build Industry 4.0

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-Big data and analytics

-Simulation

-Horizontal & Vertical system integration

-Autonomous robot

-Industrial internet of things

-Additive manufacturing

-The cloud

-Cyber security

-Augmented reality

BIG DATA AND ANALYTICS

Collection and comprehensive evaluation of data from many different sources—production equipment and systems as well as enterprise- and customer-management systems—will become standard to support real-time decision making.

SIMULATION

Simulations will be used more extensively in plant operations to leverage real-time data and mirror the physical world in a virtual model. This will allow operators to test and optimize the machine settings in the virtual world before implementation

HORIZONTAL AND VERTICAL SYSTEM INTEGRATION

Companies, departments, functions, and capabilities will become much more cohesive, as cross-company, universal data-integration networks evolve and enable truly automated value chains.

AUTONOMOUS ROBOTS

Robots will interact with one another and work safely side by side with humans and learn from them. These robots will cost less and have a greater range of capabilities than those used in manufacturing today.

THE INDUSTRIAL INTERNET OF THINGS

Products will be enriched with embedded computing. This will allow field devices to communicate and interact both with one another and with more centralized controllers, as necessary. It will also decentralize analytics and decision making, enabling real-time responses.

ADDITIVE MANUFACTURING

Companies have just begun to adopt additive manufacturing, such as 3-D printing, which they use mostly to prototype and produce individual components. These methods will be widely used to produce small batches of customized products that offer construction advantages, such as complex, lightweight designs.

THE CLOUD

More production-related undertakings will require increased data sharing across sites and company boundaries. At the same time, the performance of cloud technologies will improve. As a result, machine data and functionality will increasingly be deployed to the cloud, enabling more data-driven services for production systems.

CYBERSECURITY

With the increased connectivity and use of standard communications protocols , the need to protect critical industrial systems and manufacturing lines from cybersecurity threats increases needing protection

AUGMENTED REALITY

Augmented-reality-based systems support a variety of services, such as selecting parts in a warehouse and sending repair instructions over mobile devices. Companies will make much broader use of augmented reality to provide workers with real-time information to improve decision making and work procedures.