SIEMENS

DIGITAL INDUSTRIES SOFTWARE

ABOUT OF

OUR COMPANY

Siemens Limited is a technology company focused on industry, infrastructure, digital transformation, transport as well as transmission and generation of electrical power.

It is the flagship listed company of Siemens AG in India.

The company’s business structure is well oriented in meeting the needs of the industry in improving efficiency, quality, flexibility and speed.

INDUSTRIES :

01 AUTOMOTIVE MANUFACTURING

02 BATTERY MANUFACTURING

03 CHEMICAL INDUSTRIES

04 DATA CENTERS

05 ELECTRONICS INDUSTRIES

06 GLASS AND SOLAR

07 HEALTHCARE

08 INTRALOGISTICS

09 MINING INDUSTRIES

10 MACHINERY AND PLANT CONSTRUCTION

11 OIL AND GAS INDUSTRIES

12 SEMI CONDUCTORS

AUTOMOTIVE MANUFACTURING

APPLICATIONS

1 . VEHICLE MANUFACTURING

2. TRANSPORTATION

3. TECHNOLOGY DEVELOPMENT

4. MOBILITY SERVICES

5. SUPPLY CHAIN MANAGEMENT

SOLUTIONS

1. AUTOMATED GUIDED VEHICLES (AGVs)

SIMOVE is based on standard Siemens automation and drives components and a modular software platform

With SIMOVE you are able to easily implement and automate AGVs (automated guided vehicles) in your production.

- an easy integration into existing infrastructure
- a modular and standardized way
- an open concept that allows tailored application
- minimal engineering and commisioning efforts

SOLUTIONS

2. SIMOVE FLEET MANAGER

SIMOVE Fleet manager controls various types of AGVs for your specific use case via a single system.

- It easily connects to various IT hosts systems.
- Ensures on time deliveries through dynamic traffic analysis
- Prevents interruption through early maintainance information
- Can flexibly adapt to customer needs

ACCELERATED PRODUCT DEVELOPMENT

Accelerate product development using the Siemens suite of tools and solutions that are designed to help automotive manufacturers speed up the product development process. It includes a range of software tools, simulation and testing capabilities, and data management solutions.

You need to accelerate the design exploration process using a simulation environment that enhances collaboration. Then you can automatically generate multiple designs so that you can identify the most competitive and compliant configuration.

CASE STUDY - NISSAN TECHNICAL CENTER EUROPE

Challenges

- Update a popular existing model
- Exceed customer expectations
- Accelerate product development

Keys to success

- Work in close cooperation with Siemens Digital Industries Software partner
- Use NX for fast surfacing and analysis
- Use Simcenter 3D to optimize weight and performance
- Use Teamcenter for effective control of all engineering data
- Share data quickly and easily within the company and with suppliers

Results

- Development time cut from six years to three years
- Design data generated in 20 percent less time
- Created an award-winning model
- Accolades for attention to detail from independent car buyers guide
- New emission targets achieved
- No need for expensive and time-consuming prototypes
- Control of engineering changes across the global organization
- Fast and accurate communication with supply chain

AUTOMOTIVE SMART MANUFACTURING

VIRTUAL MANUFACTURING

Unite the digital and real worlds to design for automation. Enable operational flexibility and virtually commission equipment and lines to ensure a successful launch with fast ramp-up.

- Validate producibility with a reliable virtual version of production
- Reduce costs and ramp-up time while enhancing precision
- Produce sustainably by simulating energy and material usage
- Identify, track and achieve manufacturing metric

RAPID FACTORY TRANSFORMATION

Update operations with next-level automation. Connect IT and OT by leveraging AI, machine learning, IIoT, edge computing, the cloud and the Industrial Metaverse.

- Apply advanced automation and the digital twin to legacy systems
- Establish a single source of product and process data
- Train maintenance personnel using virtual solutions to reduce training time and minimize risk of manual errors

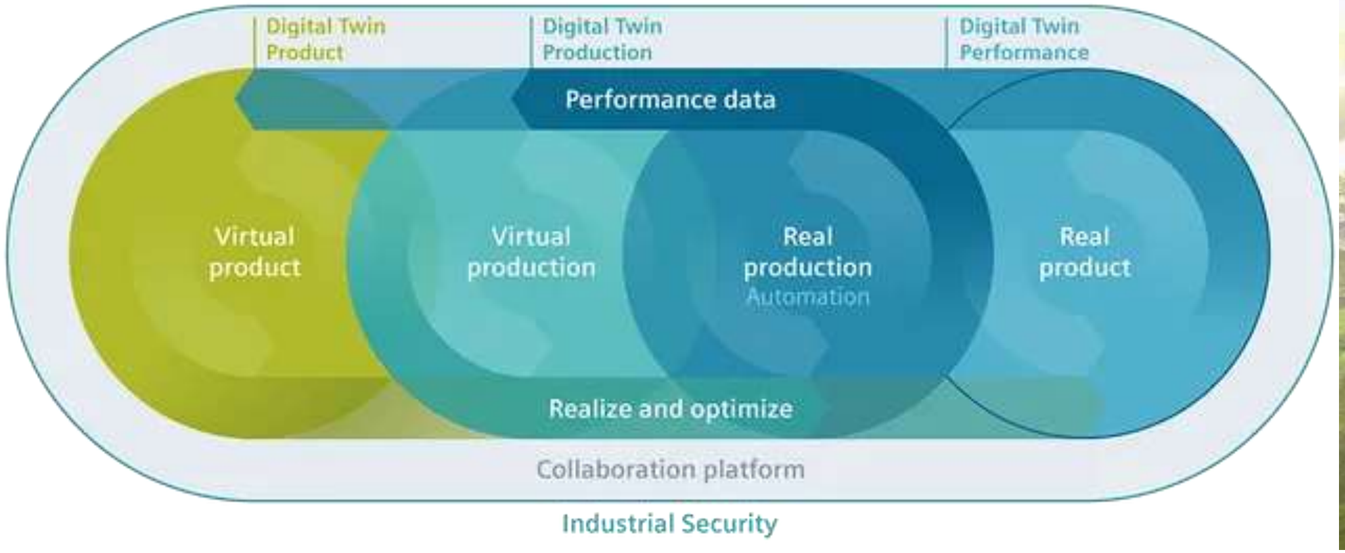
INTELLIGENT PRODUCTION EXCELLENCE

Foster a manufacturing ecosystem that's autonomous, predictive and responsive. Monitor and adjust processes in real time, optimize supply chain operations and logistics and make progress toward carbon neutrality.

- Gain complete visibility into every step of your operations
- Identify and mitigate issues with automated anomaly detection
- Eliminate unplanned downtime in production

VINFAST

VinFast is using the comprehensive offerings from Siemens that combines Product Lifecycle Management (PLM) software such as the industry-leading Tecnomatix portfolio with Manufacturing Operations Management (MOM), through the new harmonized, holistic portfolio Siemens Opcenter, to realize lean manufacturing across all phases, and with Totally Integrated Automation for all automation, including robots, conveyors, presses and milling machines.



NISSAN, JAPAN

1) **Digitalization and Automation:**

- Digital Twin Technology: Siemens provides Nissan with digital twin solutions, enabling the creation of virtual replicas of physical assets, processes, and systems. This technology allows Nissan to simulate, predict, and optimize manufacturing processes, leading to improved efficiency and reduced time-to-market for new vehicles.
- Manufacturing Execution Systems (MES): Siemens' MES solutions help Nissan streamline and monitor production processes in real-time. This integration facilitates better coordination and control over manufacturing operations, enhancing productivity and quality.

2) **Industry 4.0 and Smart Manufacturing:**

- Smart Factory Initiatives: The collaboration promotes the implementation of Industry 4.0 principles within Nissan’s manufacturing plants. Siemens' expertise in industrial automation and smart manufacturing enables Nissan to create more flexible and efficient production lines, capable of adapting to changes in demand and production requirements.
- IoT and Connectivity: Siemens’ IoT solutions connect machines, systems, and data across Nissan’s production facilities, providing valuable insights and enabling predictive maintenance. This connectivity helps Nissan minimize downtime and optimize resource utilization.

NISSAN, JAPAN

.3) **Sustainability and Energy Efficiency:**

- Energy Management Solutions: Siemens supports Nissan in implementing energy-efficient practices and technologies within their manufacturing processes. This includes optimizing energy consumption and integrating renewable energy sources to reduce the overall environmental impact of vehicle production.

4) **Training and Development:**

- Skill Enhancement Programs: Siemens collaborates with Nissan to provide training and development programs for their workforce. These programs focus on upskilling employees in the latest digital and automation technologies, ensuring that they are well-equipped to handle advanced manufacturing systems.

These solutions can be implemented across various strategic locations in the fields of automotive manufacturing.

1) Detroit, USA: As the historic hub of the automotive industry in the U.S., Detroit hosts major car manufacturers and their supply chains. Implementing Siemens' digital twin technology and advanced automation solutions can help these manufacturers enhance production efficiency and maintain competitiveness in a highly dynamic market.

2) Stuttgart, Germany: Home to several leading automotive companies like Mercedes-Benz and Porsche, Stuttgart is an ideal location for deploying Siemens' manufacturing execution systems and smart factory initiatives. These solutions can support high-quality production and innovation in luxury and performance vehicle manufacturing

BATTERY MANUFACTURING

APPLICATIONS

1 . CONSUMER ELECTRONICS

2. PORTABLE POWER

3. TELECOMMUNICATIONS

4. INDUSTRIAL APPLICATIONS

5. AUTOMOTIVE INDUSTRIES

SOLUTIONS

- **DIGITAL TWIN TECHNOLOGY -** Siemens uses digital twin technology to create virtual replicas of physical battery manufacturing processes. This allows manufacturers to simulate, analyze, and optimize production lines before implementation, reducing errors and downtime.

- **PRODUCTION LIFE CYCLE MANAGEMENT (PLM)-** Siemens' PLM software manages the entire lifecycle of battery products from conception through design, manufacturing, service, and disposal. It ensures seamless integration and data flow across different stages of production.

SOLUTIONS

- **MANUFACTURING EXECUTION SYSTEMS (MES) -** Siemens' MES solutions enable real-time monitoring and control of production processes. They help in tracking, documenting, and managing every step of the battery manufacturing process, ensuring compliance with industry standards and improving traceability.

- **INDUSTRIAL INTERNET OF THING (IIOT) -** Siemens leverages IIoT technologies to connect machines, systems, and sensors across the production line. This connectivity facilitates data collection and analysis, enabling predictive maintenance, reducing downtime, and optimizing operational efficiency.

SOLUTIONS

- **IT/OT CONVERGENCE -** Siemens bridges the gap between Information Technology (IT) and Operational Technology (OT) by integrating data from production systems (OT) with enterprise systems (IT). This convergence enhances decision-making, improves resource management, and fosters innovation in battery manufacturing.

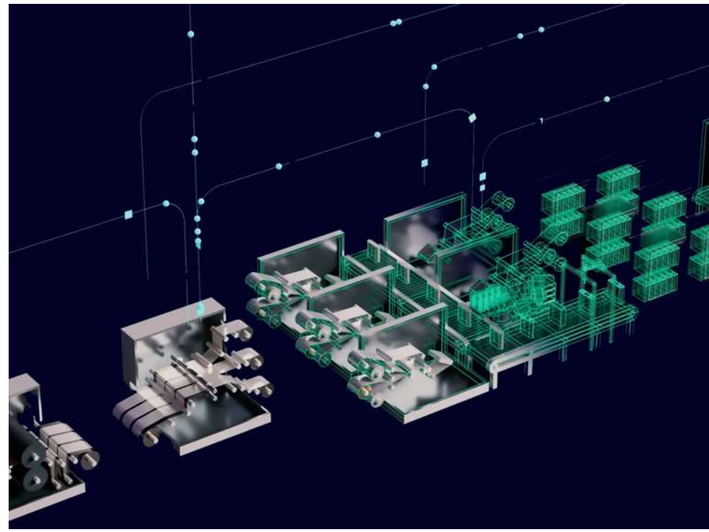
1. LITHIUM-ION AND OTHER BATTERIES

In the production of lithium-ion batteries, Siemens' IT/OT convergence is pivotal. By integrating data from various production stages, Siemens ensures that battery manufacturing is more responsive and adaptable to changing demands and conditions.

The IT systems handle data management, analytics, and business processes, while the OT systems manage the physical manufacturing operations.

2. SMART BATTERY MANUFACTURING BY SIEMENS

Smart battery manufacturing by Siemens is characterized by the use of advanced digitalization and automation technologies to create highly efficient, flexible, and sustainable production environments.



Siemens integrates AI-driven analytics, machine learning, and edge computing to provide real-time insights and predictive maintenance capabilities. Their solutions enable manufacturers to detect anomalies, predict equipment failures, and optimize production schedules.

SIEMENS AND NORTHVOLT (SWEDEN) COLLABORATION

1. **Digital Twin Technology**: Siemens provided digital twin technology to create virtual replicas of Northvolt's manufacturing processes. This enabled Northvolt to simulate and optimize production lines before physical implementation, significantly reducing errors and downtime.
2. **Totally Integrated Automation (TIA)**: Siemens' TIA platform integrated all automation components, from controllers and software to communication and safety technologies. This integration ensured seamless operation and real-time monitoring of the entire production process.
3. **MindSphere**: Siemens' cloud-based IoT operating system, MindSphere, connected machines and systems across the plant. This facilitated real-time data collection, analysis, and predictive maintenance, minimizing unexpected downtimes and improving operational efficiency.
4. **Product Lifecycle Management (PLM)**: Siemens' PLM software managed the lifecycle of battery products from design to disposal. This ensured traceability, regulatory compliance, and continuous improvement in production processes.

SIEMENS AND ACC (FRANCE) COLLABORATION

1. **Digital Enterprise Suite**: Siemens' Digital Enterprise Suite provided ACC with comprehensive digitalization tools, from design and simulation to production and services. This suite integrated hardware and software to create a fully digitalized manufacturing environment.
2. **SIMATIC PCS 7**: Siemens implemented its SIMATIC PCS 7 process control system to automate the entire production process. This system offered high flexibility, scalability, and reliability, essential for large-scale battery manufacturing.
3. **Industrial Edge**: By leveraging Siemens' Industrial Edge computing technology, ACC could perform real-time data processing at the edge of the network. This improved response times and allowed for immediate adjustments in the manufacturing process, enhancing efficiency and product quality

LOCATIONS

1) Shanghai, China: Given China's significant investment in electric vehicle (EV) technology and battery production, Shanghai is a strategic location for implementing Siemens' end-to-end automation and energy management solutions. This can help meet the growing demand for high-quality batteries in the EV market.

2) Seoul, South Korea: South Korea is a leader in battery technology, with companies like LG Chem and Samsung SDI at the forefront. Implementing Siemens' quality management systems in Seoul can ensure the production of reliable and efficient batteries.

ELECTRONICS INDUSTRIES

APPLICATIONS

1 . CONSUMER ELECTRONICS

2. COMPUTING AND IT

3. TELECOMMUNICATIONS

4. INDUSTRIAL ELECTRONICS

5. AUTOMOTIVE ELECTRONICS

SOLUTIONS

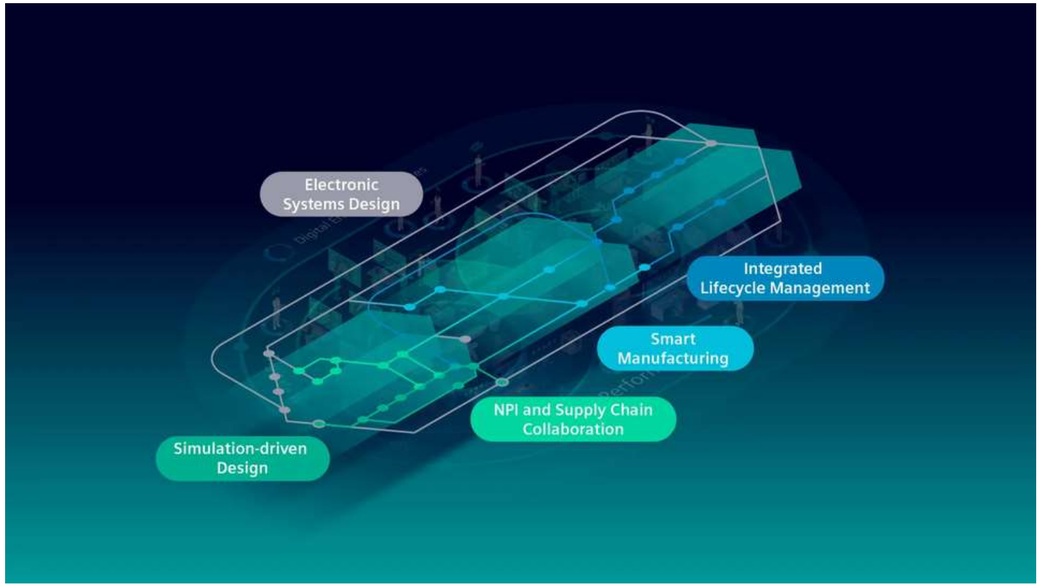
1. ELECTRONICS SYSTEM DESIGN

- **EDA (Electronic Design Automation) Tools**: Siemens offers advanced EDA tools through its subsidiary, Mentor Graphics. These tools include solutions for PCB design, IC design, and FPGA design, enabling high-performance and reliable electronic products.
- **Simulation and Verification**: Siemens' simulation tools allow designers to test and validate electronic systems in a virtual environment, ensuring performance and reliability before physical prototyping.
- **Digital Twin**: Siemens provides digital twin technology to create virtual models of electronic systems. This enables real-time monitoring and optimization throughout the design and production process.

SOLUTIONS

2. INTEGRATED LIFE CYCLE MANAGEMENT

- **PLM (Product Lifecycle Management)**: Siemens' Teamcenter PLM software manages the entire lifecycle of electronic products from initial concept through design, manufacturing, and end-of-life. It ensures seamless integration and collaboration across all stages of development



- **Data Management**: Siemens offers robust data management tools to handle the vast amounts of data generated during the lifecycle of electronic products, ensuring data integrity and accessibility.

SOLUTIONS

3. NEW PRODUCTION (NPI) AND SUPPLY CHAIN

- **NPI Solutions**: Siemens provides tools and methodologies for efficient new product introduction. This includes design for manufacturability (DFM) and early supplier involvement (ESI) to ensure that new products are designed with manufacturing and supply chain considerations in mind.
- **Supply Chain Management**: Siemens' supply chain solutions help manage and optimize the entire supply chain, from procurement and logistics to production and delivery. This includes supplier collaboration platforms and inventory management systems.

SOLUTIONS

4. SMART MANUFACTURING

- **Industrial Automation**: Siemens offers a range of automation solutions, including PLCs, SCADA systems, and industrial robots. These tools automate various manufacturing processes, enhancing efficiency and precision.
- **IIoT (Industrial Internet of Things)**: Siemens' MindSphere platform connects machines, systems, and sensors across the production floor. This facilitates real-time data collection and analysis, enabling predictive maintenance and optimization of manufacturing operations.
- **Manufacturing Execution Systems (MES)**: Siemens' MES solutions, such as Opcenter, provide real-time monitoring and control of manufacturing processes. They help in tracking production, managing quality, and ensuring compliance.

SIEMENS AND BOZHON (CHINA) COLLABORATION

- **Automation and Digitalization**: By automating repetitive tasks and integrating digital tools, Bozhon significantly increased its production efficiency. The streamlined processes reduced cycle times and improved throughput.

- **Precision and Consistency**: Siemens' solutions enabled precise control and monitoring of production parameters, ensuring consistent product quality. Advanced analytics helped in identifying and addressing quality issues promptly.

- **Implementation of Smart Manufacturing and Real-Time Monitoring and Predictive Maintenance**: The integration of IoT and MES systems provided real-time insights into production processes. Predictive maintenance capabilities reduced downtime and maintenance costs, contributing to a more reliable production environment.

- **Optimized Operations and Data-Driven Decision Making**: The availability of real-time data and advanced analytics tools empowered Bozhon to make data-driven decisions. This optimization extended across supply chain management, inventory control, and production scheduling.

LOCATIONS

1) Silicon Valley, USA: As a global center for technology and innovation, Silicon Valley is home to numerous electronics and semiconductor companies. Siemens' smart manufacturing and PCB design solutions can enhance production capabilities and support rapid innovation cycles in this competitive environment.

2) Shenzhen, China: Known as the "Silicon Valley of Hardware," Shenzhen is a major hub for electronics manufacturing. Siemens' supply chain optimization and automation solutions can significantly boost production efficiency and quality in this fast-paced market.

SEMI CONDUCTOR MANUFACTURING

SOLUTIONS

1. 3D IC DESIGN

- **EDA Tools (Electronic Design Automation)**: Siemens offers advanced EDA tools through its subsidiary, Mentor Graphics. These tools are essential for the design, verification, and simulation of integrated circuits (ICs), particularly 3D ICs which involve stacking multiple layers of circuitry to enhance performance and reduce footprint.

- **Calibre 3DSTACK**: Siemens' Calibre 3DSTACK tool provides comprehensive design rule checking (DRC) and layout versus schematic (LVS) verification for 3D IC designs. It ensures the integrity and functionality of stacked IC designs, addressing issues like thermal management and interconnect reliability.

- **Xpedition Substrate Integrator**: This tool facilitates the design and verification of advanced IC packaging, including 3D ICs. It integrates the design of chip, package, and board in a single environment, optimizing performance and manufacturability.

SOLUTIONS

2. SEMICONDUCTOR EQUIPMENT ENGINEERING

- **SIMATIC Controllers and HMI**: Siemens offers a range of programmable logic controllers (PLCs) and human-machine interfaces (HMIs) for precise control and monitoring of semiconductor manufacturing equipment.

- **SINUMERIK CNC Systems**: These computer numerical control (CNC) systems provide high-precision control for semiconductor fabrication equipment, ensuring accuracy in processes like wafer cutting and etching.

- **MindSphere IoT Platform**: Siemens' MindSphere connects semiconductor equipment to the cloud, enabling real-time monitoring, data analysis, and predictive maintenance.

SOLUTIONS

3. SMART MANUFACTURING IN SEMICONDUCTORS

- **Digital Twin Technology**: Siemens' digital twin technology creates virtual replicas of semiconductor manufacturing processes and equipment. This allows manufacturers to simulate, analyze, and optimize their operations before implementing changes on the production floor.

- **Manufacturing Execution Systems (MES)**: Siemens' Opcenter MES provides real-time monitoring and control of semiconductor manufacturing processes. It helps in managing production workflows, ensuring quality, and maintaining compliance with industry standards.

- **Industrial Edge Computing**: Siemens' Industrial Edge solutions enable real-time data processing and analytics at the edge of the network, improving response times and operational efficiency.

SOLUTIONS

4. LIFE CYCLE MANAGEMENT IN SEMICONDUCTORS

- **Product Lifecycle Management (PLM)**: Siemens' Teamcenter PLM software manages the entire lifecycle of semiconductor products, from initial design through manufacturing, testing, and end-of-life. It ensures seamless integration and data flow across different stages of development and production.
- **Integrated Data Management**: Siemens provides robust data management tools that handle the vast amounts of data generated during the lifecycle of semiconductor products, ensuring data integrity, security, and accessibility.
- **Compliance and Traceability**: Siemens' solutions ensure that semiconductor products comply with industry standards and regulations. They also provide traceability throughout the product lifecycle, which is crucial for quality assurance and regulatory compliance.

ETRI AND AMKOR (USA AND SOUTH KOREA)

Advanced Design and Simulation Tools

For ETRI:

- **EDA Tools from Siemens (Mentor Graphics):** ETRI adopted Siemens' advanced Electronic Design Automation (EDA) tools to enhance their research and development capabilities. These tools include design, simulation, and verification solutions for developing next-generation semiconductors.
- **Simulation and Digital Twin Technology:** Siemens' digital twin technology enabled ETRI to create virtual prototypes of semiconductor devices and manufacturing processes, allowing for detailed simulations and optimizations before actual production.

For Amkor Technology:

- **Calibre Platform:** Siemens' Calibre platform provided Amkor with industry-leading verification tools for ensuring design accuracy and reliability in semiconductor packaging.
- **Xpedition Substrate Integrator:** This tool facilitated the design and verification of complex semiconductor packages, ensuring optimal performance and manufacturability.

ETRI AND AMKOR

2. Smart Manufacturing Solutions

For ETRI:

- **Opcenter Manufacturing Execution System (MES):** Siemens' Opcenter MES provided real-time monitoring and control for ETRI's experimental production lines. This system helped in managing workflows, ensuring quality, and maintaining compliance with research standards.
- **MindSphere IoT Platform:** ETRI utilized Siemens' MindSphere to connect various equipment and sensors in their labs, enabling real-time data collection, analysis, and predictive maintenance.

For Amkor Technology:

- **Industrial Automation:** Siemens supplied Amkor with a range of automation solutions, including PLCs, SCADA systems, and industrial robots. These tools automated critical stages of semiconductor packaging and testing, enhancing precision and efficiency.
- **Predictive Maintenance:** Amkor implemented Siemens' predictive maintenance solutions to reduce downtime and improve equipment utilization, leveraging real-time data analytics to predict and address potential issues before they caused disruptions.

ETRI AND AMKOR

3. **Lifecycle Management**

For ETRI:

- **Teamcenter PLM:** Siemens' Teamcenter PLM software enabled ETRI to manage the entire lifecycle of their semiconductor projects, from initial research and design through to pilot production and testing. This integration facilitated better collaboration and data management across different research teams and projects.

For Amkor Technology:

- **Comprehensive Data Management:** Siemens provided robust data management tools to handle the vast amounts of data generated during semiconductor packaging and testing. These tools ensured data integrity, security, and accessibility, enhancing traceability and compliance with industry standards.

LOCATIONS

1) Hsinchu, Taiwan: Taiwan is a key player in the semiconductor industry, with companies like TSMC leading the market. Implementing Siemens' precision automation and cleanroom solutions in Hsinchu can help maintain the high standards required for semiconductor fabrication.

2) Dresden, Germany: As a major center for semiconductor research and production in Europe, Dresden can benefit from Siemens' data analytics and big data solutions to optimize manufacturing processes and stay at the cutting edge of semiconductor technology.

PHARMA AND LIFE SCIENCES

PFIZER GERMANY

- **SIMATIC PCS 7**: Pfizer Germany uses Siemens' SIMATIC PCS 7 process control system to automate and control their manufacturing processes. This system integrates all aspects of production, from raw material handling to finished product packaging, ensuring consistency and quality.
- **Digital Twin**: Siemens' digital twin technology allows Pfizer to create virtual models of their manufacturing processes. This enables them to simulate, analyze, and optimize production lines before implementing changes in the real world, reducing downtime and improving efficiency.
- **Opcenter Execution Pharma**: Siemens' Manufacturing Execution System (MES) specifically designed for the pharmaceutical industry, helps Pfizer in tracking and documenting every step of the production process. This ensures compliance with regulatory requirements and improves traceability.
- **MindSphere IoT Platform**: By connecting their equipment and processes to Siemens' MindSphere, Pfizer can monitor production in real-time, perform predictive maintenance, and gain insights into their operations through advanced data analytics.

LIFE SCIENCE FACTORY GERMANY

- **Digital Enterprise Suite**: Siemens' Digital Enterprise Suite provides Life Science Factory with comprehensive digital tools for designing, simulating, and optimizing laboratory and production processes. This suite includes software for virtual modeling, simulation, and data analytics.
- **SIMATIC IT eBR**: The Electronic Batch Recording (eBR) system from Siemens simplifies and automates batch documentation, ensuring accuracy and compliance. This system helps startups and researchers at Life Science Factory maintain high standards of quality and regulatory compliance.
- **Siemens Laboratory Automation**: Advanced laboratory automation solutions from Siemens streamline various lab processes, such as sample handling, data collection, and analysis. This increases throughput and accuracy, enabling faster development cycles.

GSK UK

- **SIMATIC PCS 7**: GSK uses Siemens' SIMATIC PCS 7 for process automation in their production facilities. This system provides a high level of flexibility, allowing GSK to quickly adapt to changes in production requirements while maintaining consistent quality.
- **Opcenter RD&L**: Siemens' Opcenter Research, Development & Laboratory (RD&L) software helps GSK streamline their R&D processes. This includes managing formulations, recipe development, and compliance with regulatory requirements.
- **MindSphere IoT Platform**: By integrating their manufacturing processes with Siemens' MindSphere, GSK gains real-time insights into their operations. This enables predictive maintenance, process optimization, and improved decision-making based on data analytics.
- **Teamcenter PLM**: Siemens' Product Lifecycle Management (PLM) software, Teamcenter, helps GSK manage the entire lifecycle of their products, from initial development through to manufacturing and distribution. This ensures that all product data is integrated and accessible, facilitating compliance and continuous improvement.

LOCATIONS

1) Basel, Switzerland: Basel is home to several leading pharmaceutical companies, including Novartis and Roche. Siemens' lab automation and manufacturing execution systems can enhance the efficiency and compliance of pharmaceutical production in this globally recognized hub.

2) Boston, USA: Known for its concentration of biotech and pharmaceutical companies, Boston is an ideal location for deploying Siemens' digital health solutions and advanced manufacturing technologies. This can support the development and production of innovative medical treatments and devices.

THANKS FOR WATCHING

https://www.siemens.com/global/en.html