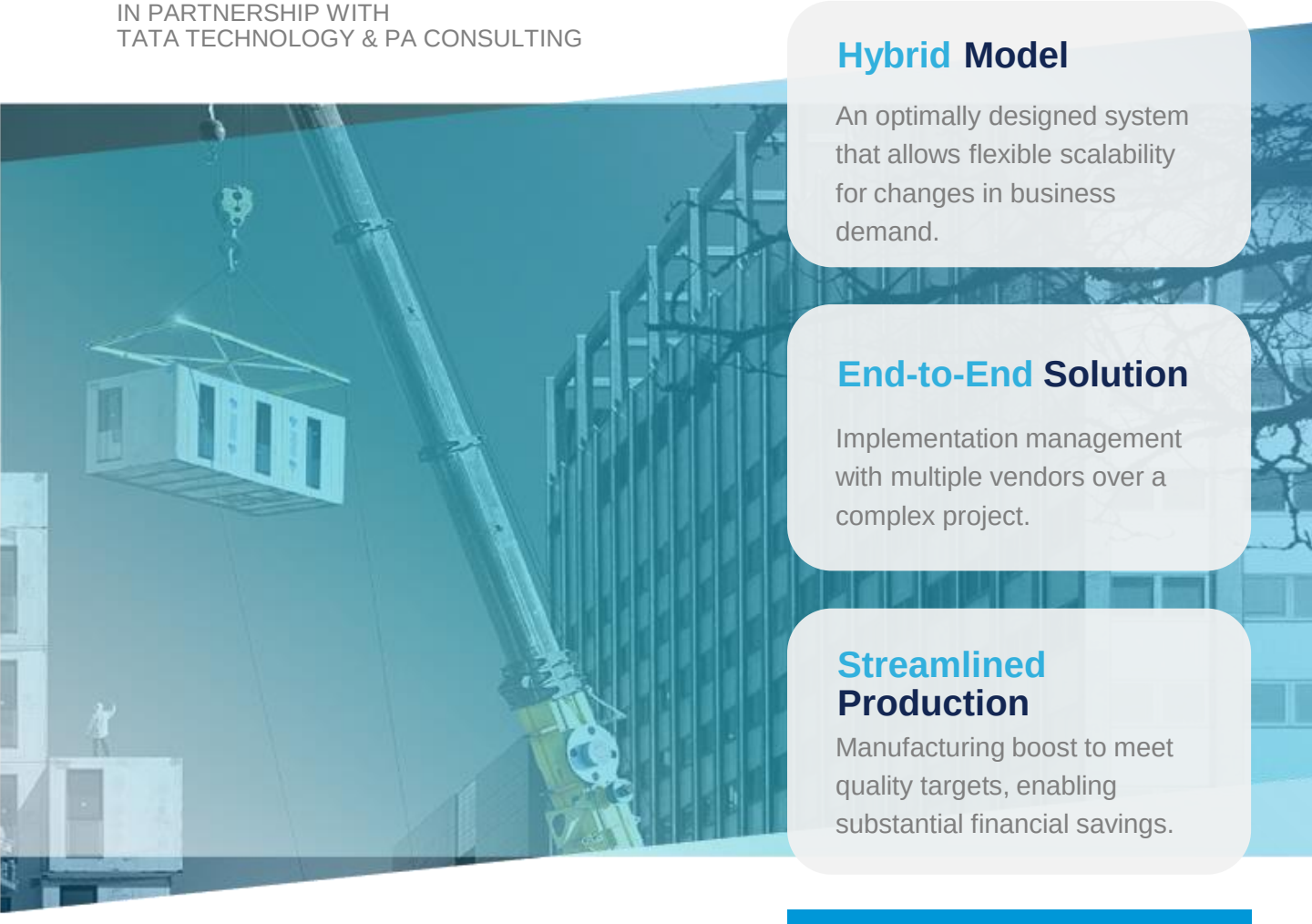
Designing Smarter Factories

IN PARTNERSHIP WITH
TATA TECHNOLOGY & PA CONSULTING



Hybrid Model

An optimally designed system that allows flexible scalability for changes in business demand.

End-to-End Solution

Implementation management with multiple vendors over a complex project.

Streamlined Production

Manufacturing boost to meet quality targets, enabling substantial financial savings.

Bringing manufacturing in-house with secure IIoT communications

A Polestar | Siemens Case Study

To guarantee better quality in production, the customer required the implementation of a secure by design network, able to connect its MES in a greenfield facility. Thanks to Polestar's Industrial IoT services, it was possible to efficiently track, control, and optimise manufacturing. The project needed a carefully designed, secure architecture to safeguard the whole network from potential threats.

Customer:
Modular Housing Manufacturer

Industry:
Manufacturing

No. of Employees: 11,000

Solution:
Industrial Networking Systems Secure Implementation for MES.

Location: Kent, U.K.

Industrial Networking Systems secure implementation for the company's Manufacturing Execution System (MES).

A MES is a Group of Systems to track and document the transformation of raw materials to finished goods. MES' provide information that helps manufacturing decision makers understand how current conditions on the plant floor can be optimized to improve production output. For maximum effectiveness, they require the implementation of secure Industrial Networking Systems (INS) to prevent breaches into their operation.

The customer's the latest plant was developed to manufacture volumetric modular housing solutions. From its technologically innovative sites, they create different modular housing products designed to the highest specifications and standards.

To lead the market, the company invests in new scalable manufacturing capacity, and in developing a highly engineered product. The new factory uses state-of-the-art production technology in lean production facilities that enable customisation of virtual designs to physical products at a massive scale.

From this new facility, the company deploys one of its largest operations in the United Kingdom. The client required the implementation of an isolated secure network for production to operate its MES.

Additionally, the customer required remote access for partners to control new production lines using a secure Virtual Private Network (VPN).

This implementation allows the new production site to securely become IIoT ready while enabling business scalability and continuity, as well as ensuring quality and efficiency in operations.

Solution Brief. As stable & continuous connections become crucial for operating performance, companies are relying more on secure IIoT networks to safely connect employees, facilities, and machinery.

This project involved the development of the following deliverables, done in collaboration with the INS Specialists listed below:

1. A Secure **INS** Implementation, factory Wireless, and a Ring Network topology on switches for redundancy and business continuity. Best-in-class Palo Alto Firewalls and VPN services, implemented for security. Executed by **Polestar.**

2. The implementation of the **MES** Platform, built by TATA Technologies with Siemens Systems.

3. Project Management & Consultancy in a partnership between Polestar & PA Consulting. Cabling and containment services, installed by J Brand.

Business Challenge

The customer's greenfield facilities in Kent will have the potential to deliver more than 1,000 homes a year. It will consist of a single 150,000 sqft manufacturing facility and a 15,500 sqft office building.

Its CNC-controlled and semi-automated production process is based on fully federated, data-rich models from volumetric modules done over CAD Designs. Managing this scale of production and manufacturing complexity created exciting challenges that the project team addressed.

A MES that runs over an IIoT platform helps to manage such complexity by tracking and documenting processes. Nevertheless, the IIoT platform requires stability so that communication across the production line never stops (high availability).

Enhanced and stable access to real-time information across the facility is key to boost faster and better-informed decision making. The customer's production line requires agility and efficient asset management; with this, it is required to have clarity on production outputs, schedules, quality updates, and the effect of changeover. All critical information that management needs to access constantly.

Under no circumstances could the company allow unstable networks or vulnerabilities for cybersecurity threats that usually target the manufacturing industry.

Management at the new plant understood the potential benefits that **Industrial Secure Networks** provide to operations. Therefore, they required an integration with new technologies to ensure secure-by-design communications.

In order to implement such project, at Polestar we collaborated with Siemens, TATA Technologies, PA Consulting, and J Brand in the Consulting & Design of Services, Project Management, Implementation, Documentation, and Systems Support.

The project had two goals. The main one was to improve the safety and redundancy of the MES system itself.

A secondary but not less relevant goal was to isolate the production system from the Enterprise Resource Planning solution.

Our Solution

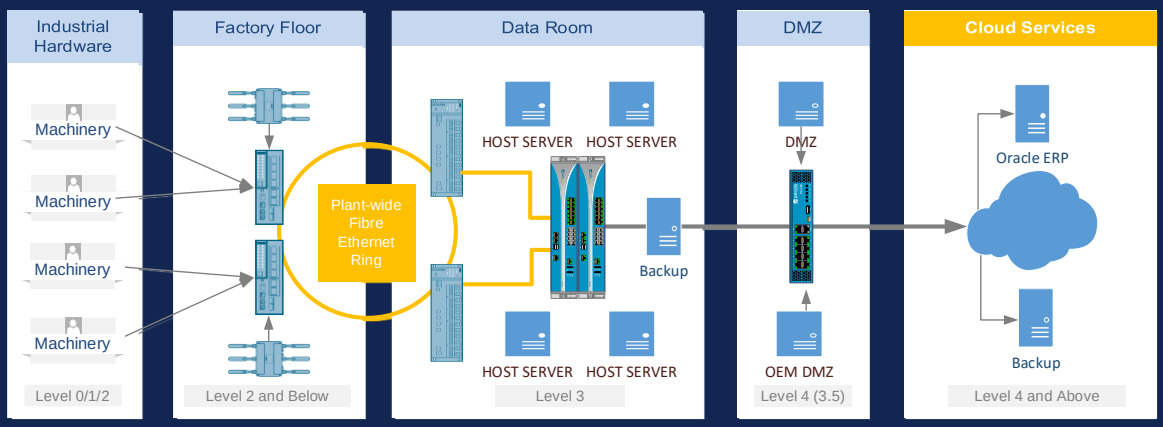
Through collaboration with Siemens and other partners, Polestar designed a multilayered architecture that incorporates multiple security measures at different levels. The Polestar consulting team has a high-level knowledge and experience in planning and implementing secure by design MESs, which is beneficial for the customer to understand all possible security incidents and create a redundant and reliable network.

This project was planned for delivery of circa six months and spanned pre-project consultancy & planning, the implementation of the operational technology (OT), the fiber ring network (plus Wi-Fi AP's and copper cabling), and the OT virtual environment, as well as in life support.

Main technologies implemented, as briefly shown in the Project Architecture snippet below, were:

- Palo Alto Firewalls: Prevention-based architectures through virtualized and container firewalls, allowing for visibility and rapid responses.
- Siemens SCALANCE Switches: Industrial Ethernet for harsh production environments.
- Siemens Access Points: Industrial Wireless LAN Access for applications in automated manufacturing.
- HPE Servers: Rack-optimised secure servers with an agile infrastructure for Hosting & Backup.
- VMware: Host for Virtual Machines.
- Veeam: Business Continuity (Back-up & Replication).
- Microsoft Enterprise Software.

Project Architecture



Outcomes

A secure and resilient network based on the latest security requirements was provided granting access to the MES at all production levels.

Polestar delivered to the customer three main outcomes/benefits from this project:

1. A successful deployment of the OT system that isolates production from the ERP, allowing scalability and business continuity.

2. A fully automated oversight and management view of production at all levels of the modular housing units and at all stages of the process through the MES.

3. The assurance of quality and efficiency built into the factory processes from the start for the Greenfield facility.

“Without a secure IT network, is hard for a business to achieve high systems predictability. Without predictability, businesses become inefficient and stagnant”

-Julian Smith, Polestar’s Managing Director.

As Polestar keeps providing services for securing industrial networks and MES’s we will continually be improving the processes of any industrial business that require the implementation of the latest IIoT and Industry 4.0 systems.

Our goal is to help businesses to have their people, products, and machines connected to the Internet while efficiently and securely monitoring and controlling processes, automatically.

Yielding improvements such as the reduction of decision-making time and response, delivering optimized and more profitable manufacturing with the peace of mind of having a secure by design industrial network.

For more information

To find out about Polestar’s Secure Implementations and other Industrial Internet of Things (IIoT) solutions, go to:

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