

INDUSTRIAL | HIGH-PRECISION MANUFACTURING

From the Cleanroom to SAP: How FAE Connected Its Production Machines with vNode

Bidirectional OT-IT Integration without External Programming

CLIENT:



FAE

Introduction

F&E, a family-owned manufacturer of electronic sensing solutions for the automotive and industrial sectors, began implementing **SAP Business One with HANA** to digitalize its plant. The **BEAS** manufacturing module, integrated within SAP, lacked the ability to communicate with the plant's OT environment: it could neither connect to the OPC Servers of its machines nor extract production data in real time. With vNode, F&E connected its **10 cleanroom machines**, Siemens (S7-1500, S7-1200, ET200) and Mitsubishi, using three modules: **OPC DA Client, Scripting Module, and SQL Client**. The integration is fully bidirectional: production data flows up to SAP and configuration parameters are automatically pushed down to the machines. The project, completed in approximately six months with only 1–2 months dedicated directly to vNode, has eliminated the dependency on external programmers and the per-seat licensing costs of the previous MES.

- ✓ **Bidirectional connection** of 10 heterogeneous machines with SAP Business One without custom programming.
- ✓ **Full real-time traceability:** OK/Not OK parts with defect type, weights, tooling, and raw material codes.
- ✓ **Automatic machine parameterization from SAP:** the operator opens a work order and the machine configures itself.
- ✓ **Full in-house autonomy:** modifying, adding, or reconfiguring an integration without outsourcing.



"Before, integrating a new machine required outsourcing external programming at a high cost and with little flexibility. With vNode we do it ourselves: fast, easy, and without depending on anyone"

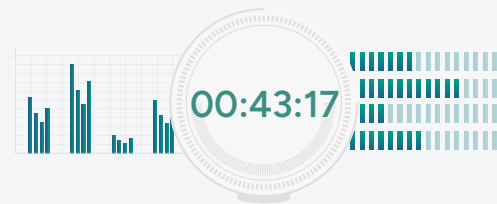
-Eduard Frechilla, Technical Manager, FAE

Objetives

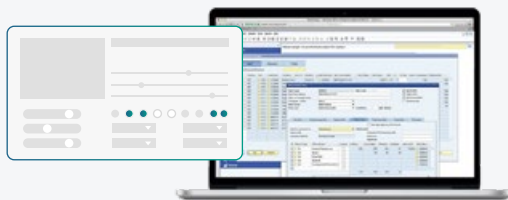
The project arose from a specific need: **BEAS Manufacturing**, SAP Business One's production module, has no native ability to communicate with OT environments. FAE needed to meet four objectives:



Connect the 10 cleanroom machines with SAP Business One / BEAS for manufacturing traceability.



Record in real time: OK and Not OK part counts with defect type, weights, configured tooling, and raw material codes.



Automatically parameterize machines from SAP: the operator opens a work order and parameters are applied without manual configuration.



Reduce dependency on external outsourcing and eliminate the per-seat licensing costs of the previous MES.

Challenges

The path toward OT-IT integration presented four three challenges:

-  **Native SAP-OT gap:** BEAS does not support direct communication with OPC Servers or machine data extraction. An intermediate OT-IT connector was required.
-  **Heterogeneous machine environment:** the cleanroom combines Siemens machines (S7-1500, S7-1200, and ET200 PLCs with SIMATIC OPC Server), Mitsubishi machines (with their own official OPC Server), and a Tape Blanking machine from manufacturer KEKO that has no OPC Server; instead, a COGNEX machine vision camera generates the files via FTP.
-  **Rigid and costly previous MES:** the previous MES system billed per workstation and any integration change required external outsourcing, which increased costs and slowed down updates.

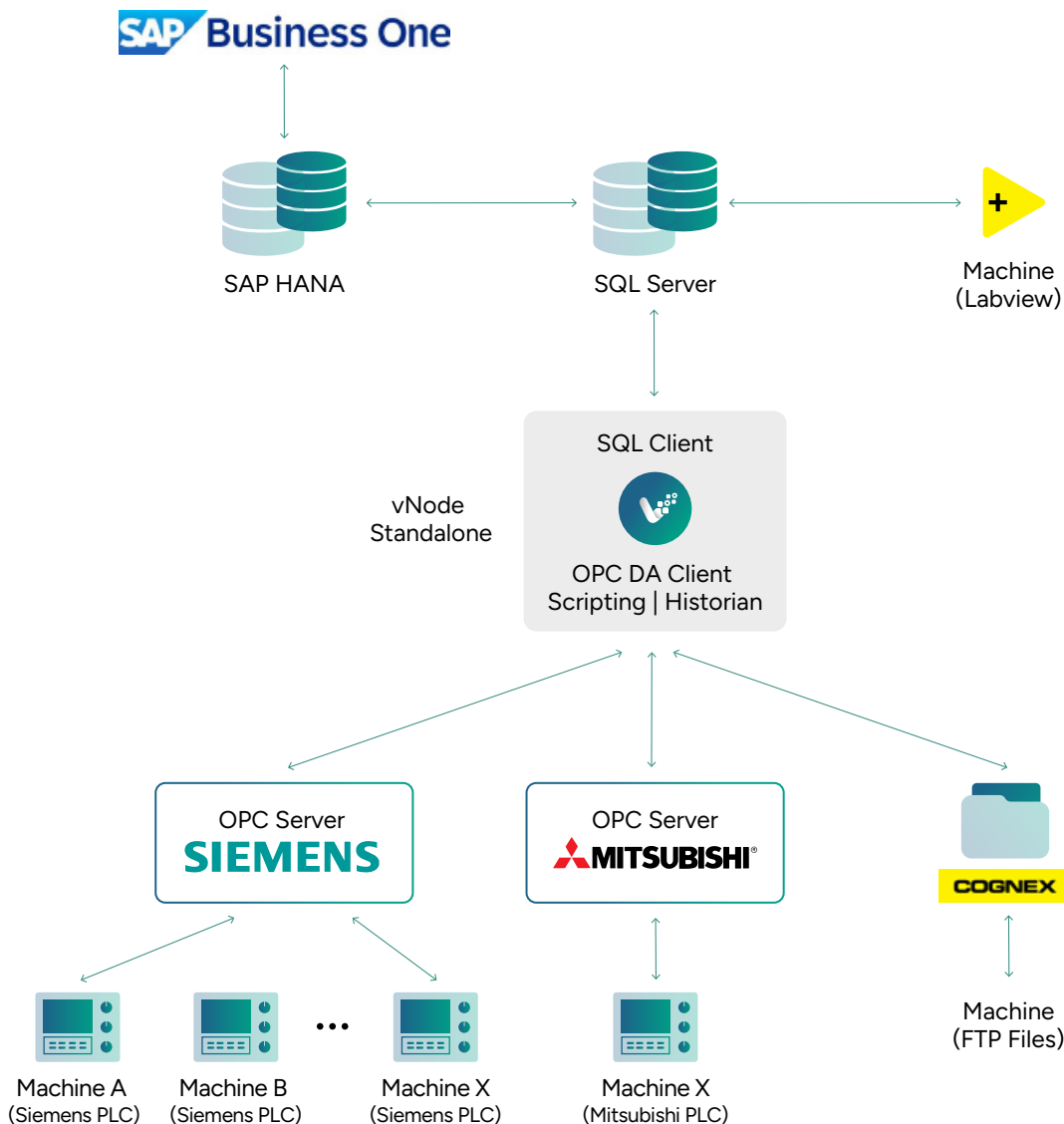


Solution

Vester Business proposed an **architecture based on three vNode Automation modules**, installed on the same virtual Windows Server 2008 R2 where the OPC Servers were already running a key technical decision to avoid DCOM configuration issues in OPC communication. The SQL Server, which acts as a bridge database toward SAP HANA, resides on a separate server.

Module 1 | vNode OPC DA Client

vNode connects directly to the two OPC Servers already installed on the virtual server: the Siemens **SIMATIC OPC Server** for the S7-1500, S7-1200, and ET200 PLCs, and the official Mitsubishi **MX OPC Server**. The configuration is entirely visual, with no programming required: simply select the OPC server, browse the tag tree, and configure the read. Adding a new variable (for example, an additional temperature) is a process that Eduard Frechilla describes as “a matter of hours.”



Module 2 | vNode Scripting Module

The **Tape Blanking** machine from manufacturer KEKO has no OPC Server. A **COGNEX** machine vision camera generates the FTP files with production data. vNode Scripting Module enables acquiring, parsing, and processing those files using scripts. The programming was addressed on two fronts: technical support from Vester Business and the use of artificial intelligence to generate and refine the code, reducing implementation time. Eduard describes it this way: "We would request it from AI, it would give us a code proposal, we would apply it, and by the second or third iteration it worked."

Module 3 | vNode SQL Client (Bidirectional Integration)

The third module completes the OT-IT loop. All variables read by vNode are written to SQL Server via **triggers**: each part change activates the saving of the relevant tags along with the work order number and manufacturing phase from SAP, ensuring full traceability.

The integration is **bidirectional**: when the operator opens a work order in SAP, the machine configuration parameters (stored in SAP and transferred to SQL Server) are read by vNode and written directly to the PLC. The machine is configured automatically, with no manual intervention from the operator.



What Flows Between OT and IT:

Machine → SAP OK / Not OK part count · Defect type · Weight · Configured tooling · Raw material codes · Process variables (temperatures, etc.)

SAP → Machine Configuration parameters linked to the work order and manufacturing phase.

Results



10 machines connected bidirectionally with SAP Business One through vNode, covering 100% of the cleanroom machines in the initial phase.



Project 90% complete in 6 months: with only 1–2 months of direct dedication to vNode.



Automatic parameterization: machines receive configuration from SAP without manual operator intervention when a work order is opened.



Eliminates per-seat licenses from the previous MES and the outsourcing dependency for every new modification or integration.



Fast and intuitive learning curve: FAE's technical team became fully autonomous within weeks; the OPC DA Client module can be mastered in days, and the scripting module in just a few weeks.



Full real-time traceability: engineering, production, and quality teams access dashboards with part counts, defect types, weights, and tooling data.

Conclusion

vNode has enabled FAE to make the OT-IT leap that BEAS alone could not deliver, connecting a heterogeneous machine environment with SAP Business One quickly, bidirectionally, and without external programming. The technical team has gained **full autonomy** to evolve integrations, and the architecture is ready to scale: next up are the injection molding machines at the **Cervera** plant, and in the long term, vNode as **the central OT-IT backbone connecting** all of the company's applications: ERP, BI, and beyond.



We evaluated other solutions on the market, but the costs were very high. With vNode it was Plug&Play: you download the demo from the website, install it, and you're off and running. The proof of concept was one of the best implementations we've had. And the best part is that we've barely scratched the surface of what vNode can offer.



-Juan Carlos Román
Project Manager, FAE

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