Operations Center Case Study

Enterprise energy management with legacy platform migration and multi-site consolidation.
Industry: Steel Manufacturing

Quick Facts

Attribute	Value
Customer	Usiminas Steel: South America's largest steel supplier with 13 industrial plants across Brazil
Initial Deployment	2011-2013
Scale	100,000+ I/O points, 25+ sub-systems, 100+ displays
Architecture	Fault-tolerant redundancy, multi-site Energy Center
Status	Running successfully to present day

Historical Context

This deployment represents a **30-year relationship** between customer and the Tatsoft founding team:

Era	Platform	Relationship
1990s	Unitec (DOS)	Initial software supply
Late 1990s	UniSoft InduSoft	Windows migration
2000s	FactoryLink (Siemens/USDATA)	Customer's choice based on European steel industry installed base
2011+	FactoryStudio (Tatsoft)	Emergency migration after FactoryLink discontinuation

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The Challenge

Challenge: Consolidate multi-site energy operations with heterogeneous equipment and multiple protocols, preserving local autonomy (history, alarms, synoptic) while enabling a unified corporate view (Energy Center), with high availability and point/tag scale.

Specific pain points:

- Integration of multiple vendors and legacy interfaces (OPC DA) in a distributed topology
- Lack of a central view and standardized alarms/history across areas
- Need for redundancy and fault tolerance (servers, network, clients)

Impact: Slow responses to energy events, engineering rework, and higher operational risk due to fragmented data.

Example: "Without a unified central network, the energy team had to manually correlate events and histories across areas, increasing MTTR."

Platform Crisis (2010-2011)

When selecting a platform for their new Energy Center, the customer conducted:

- Technical evaluation (FactoryStudio won)
- Market analysis of European steel plants (FactoryLink had largest installed base)

Decision: Selected Siemens FactoryLink based on installed base — reasoning that technology validated by European steel plants was "safe."

Shortly after commissioning, Siemens announced end-of-support for FactoryLink.

- Siemens offered WinCC migration — but this meant **complete restart**
- Unacceptable for a system just commissioned
- Customer contacted Tatsoft directly, based on decades of trust

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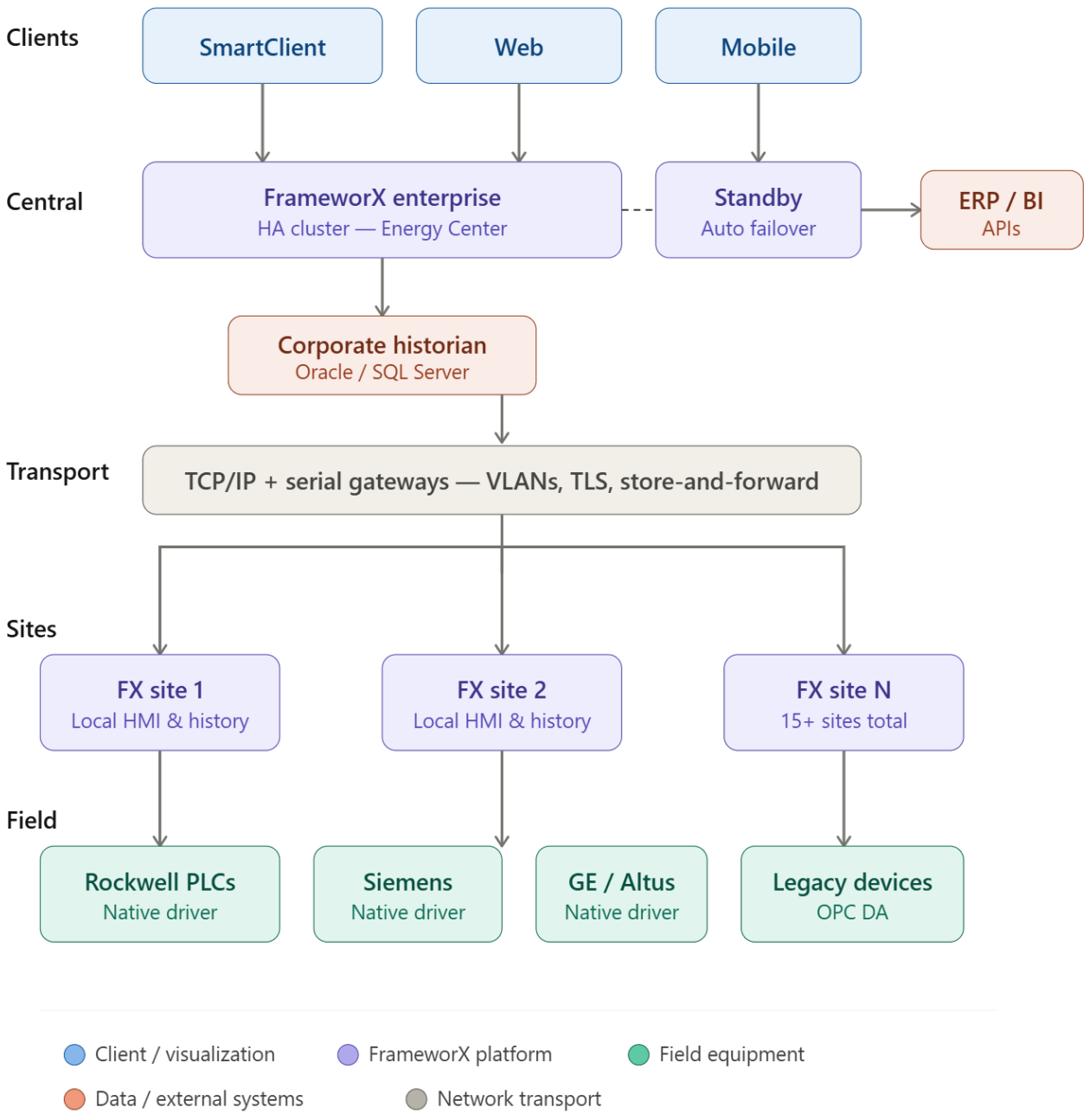
The Solution

Architecture



Tier	Component	Capabilities
Field (15+ sites)	FrameworX Site	Drivers (Altus, GE, Siemens, Rockwell), OPC DA through an OPC DA to OPC UA gateway, History & Alarms, Synoptic displays, Store & Forward, Scripts
Central	FrameworX Enterprise	Area Consolidation, Corporate Historian/Alarms, Integrations (OPC/DB/APIs), Redundancy (HA)
Clients	SmartClient / Web / Mobile	Operations & Engineering access

Connectivity

Vendor	Protocol
Rockwell	Native driver
Siemens	Native driver
GE Fanuc	Native driver
Altus	Native driver
Reliance	Native driver
Legacy devices	OPC DA, through an OPC DA to OPC UA gateway (FrameworX includes no OPC DA client connector)
Databases	Oracle, SQL Server

Topology

Layer	Component	Role	Notes
Area	FrameworX Site	Acquisition, history, alarms, HMI	Independent local operation; standardized models
Transport	TCP/IP, Serial	Telemetry and control	Network segmentation; QoS; serial/IP gateways
Central	FrameworX Enterprise	Consolidation, orchestration, APIs	Cross-area normalization; corporate dashboards
Data	Historian/DB	Corporate repository	Retention/partitioning strategy
Clients	SmartClient/WebAssembly	Operations & engineering	Multiple concurrent clients

Network Architecture

- Segmentation by area and VLANs; redundant links where critical; TLS encryption for inter-site traffic
- Gateways for serialIP conversion (RS-485/RS-232) and secure tunneling
- Legacy OPC DA gateways/proxies for older equipment
- DB connectors for corporate BI; APIs for ERP/maintenance systems

Redundancy & Failover

Central:

- Cluster/HA for real-time services, history, and alarms
- Database with tested backup/restore procedures
- Automatic failover with zero data loss

Areas:

- Independent operation continues during central outages
- Store-and-forward for network resilience
- Automatic reintegration when connectivity restores

Technical Scope

Energy Center

- Complete plant monitoring for water and energy systems
- Real-time control and optimization
- 25+ water systems with hot-standby configuration
- Advanced optimization algorithms (customer-developed)

Additional Systems (Same Platform)

System	Migration From	Capability
Furnace Optimization	ALPHA computer system	Advanced temperature controls
Bar Tracking	Custom VB application	Order tracking integration

All integrated into single FactoryStudio platform.

Key Enablers

FrameworX capabilities that made this solution possible:

Capability	Application
Multi-protocol native drivers	Connected heterogeneous equipment (Rockwell, Siemens, GE, Altus) without middleware
Fault-tolerant redundancy	Hot-standby with zero data loss during failover
Store-and-forward	Network resilience across distributed sites; automatic reintegration
Symbol Library	200+ displays built efficiently with reusable components
Template import	Areas developed independently, merged into master project
Shift-based security	Auto-logout, operator-specific permissions per shift
Area-based security	operator-specific permissions per location from the logon

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Strategic Insights

Platform Selection vs. Installed Base

This case illustrates a critical lesson: installed base indicates *past* validation. Platform selection should consider what will best serve the *next* 10-15 years — which often differs from what dominated the *previous* 10-20 years.

Migration vs. Restart

When the incumbent platform was discontinued, the customer faced a choice: restart on vendor's new platform (WinCC) or migrate to a platform that had won their original technical evaluation. The ability to migrate rather than restart preserved their investment and timeline.

The Results

- **Consolidated 15+ plant operations** into single Energy Center managing 100,000+ points
- **Eliminated manual event correlation** — unified alarms and history reduced MTTR
- **Zero data loss** during network disruptions via store-and-forward
- **50%+ reduction in development time** vs. legacy system (built-in properties and application objects)
- **35 nodes distributed** across entire plant with remote client access
- **Running successfully since 2013** — over 10 years of continuous operation

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Customer Testimonial

> "The Tatsoft FactoryStudio software, used in the migration of the Integrated Recirculation Monitoring System at the Ipatinga facility, proved to be stable and reliable, increasing the process efficiency and costs optimization."
>
> — ***Guilherme Publio Teixeira**, Manager of Energy and Utilities Systems Support, Usiminas Ipatinga*

Resources

- Usiminas Energy Management Case Study.pdf - Published case study

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This case demonstrates enterprise-scale operations center architecture with multi-vendor integration, fault-tolerant redundancy, and distributed site management.

In this section...
