

# The Power of the Semantic Layer in Manufacturing

The manufacturing industry is undergoing a rapid transformation driven by Industry 4.0, the Internet of Things (IoT), and the complexities of global supply chains. While these advancements create opportunities, they also introduce significant challenges in managing and leveraging data. Manufacturers often struggle with fragmented data residing across ERP systems, IoT sensors, MES platforms, and supplier networks, making gaining a unified view of operations difficult. Data silos, outdated tools, and inconsistent metrics hinder decision-making and limit the potential of advanced analytics and AI. Additionally, the reliance on legacy reporting workflows slows down the ability to respond to dynamic market demands, optimize production, and maintain compliance.

Manufacturers need a scalable and efficient solution to overcome these barriers and thrive in a competitive landscape. A semantic layer emerges as a critical tool, simplifying data access, fostering trust in analytics, and enabling self-service capabilities for faster, data-driven decision-making.

A [semantic layer](#) is a business representation of data that helps executives, business stakeholders, and analysts get trusted results from their data using commonly understood terms like “product”, “customer,” and “revenue”. The result is a unified and consolidated view of data across an organization.

Manufacturers leverage a semantic layer to instill trust in Generative AI and analytics-driven KPIs. A semantic layer can yield:

**\$2M+**

Analytics project cost savings

**3X**

Increase in ROI of IT investments

## How Manufacturers Use a Semantic Layer:

- 1 Supply Chain Optimization:** Integrates data from ERP, IoT, and supplier systems, enabling real-time inventory tracking, demand forecasting, and efficient supplier collaboration.
- 2 Production Efficiency Analytics:** Analyzes production data to identify bottlenecks, optimize workflows, and improve equipment effectiveness (OEE).
- 3 Quality Control and Compliance:** Provides consistent data for quality audits and regulatory compliance by unifying production and inspection data.
- 4 Customer 360 and After-Sales Support:** Combines sales, service, and IoT data to enable predictive maintenance and personalized customer experiences.

## Challenges Solved by a Semantic Layer

- **Data Silos:** Scattered data in ERP, MES, CRM, and IoT systems makes it difficult to gain a unified view of the business and its operations.
- **Outdated Tools:** Dependency on legacy tools like Microsoft Excel limit scalability and efficiency.
- **Inconsistent Metrics:** Different teams use varying definitions for KPIs, reducing trust in analytics.
- **Collaboration Barriers:** Incompatible systems hinder cross-departmental and partner collaboration.

## The ROI of a Semantic Layer



**Optimized Costs:** Reduces cloud analytics costs by 3x through efficient compute usage and workflow optimization.



**Enhanced Workforce Efficiency:** Cuts analytics project effort nearly in half, saving \$2.3 million annually for organizations with 25+ projects.



**Trusted Insights:** Standardizes data definitions for consistent reporting and confidence in decisions.



**Faster Insights:** Improves query performance by 4x, accelerating real-time analytics.

## Choosing the Right Semantic Layer Solution

AtScale's Universal Semantic Layer bridges the gap between data and analytics, enabling manufacturers to:

- Simplify analytics with consistent and business-friendly data models.
- Empower self-service capabilities across BI and data science tools.
- Scale efficiently with robust performance for large datasets.
- Ensure governance with fine-grained access controls and compliance features.

## Real-World Examples

- **Global Manufacturer:** Improved supply chain efficiency by integrating data from multiple sources and enabling self-service analytics, reducing reliance on IT teams.
- **Multinational Industrial Company:** Unified data across platforms and replaced outdated reporting workflows, significantly enhancing operational efficiency.
- **Leading Automotive Company:** Created a comprehensive "Customer 360" view, enabling seamless self-service analytics while decommissioning legacy systems.
- **Bicycle Manufacturer:** Accelerated data query performance, minimized data duplication, and improved reporting agility with a modern semantic layer solution.

## Related Resources

- [Practical Guide to a Semantic Layer](#)
- [The Business Impact of Using a Semantic Layer for AI and BI](#)
- [Buyer's Guide to a Semantic Layer](#)

### ABOUT ATSCALE

AtScale bridges the gap between data and analytics, enabling smarter, faster decision-making. With its **Universal Semantic Layer**, AtScale empowers insurance companies to build trusted data models that drive consistency and accuracy across analytics tools. Backed by over a decade of innovation, AtScale helps insurers optimize performance, reduce costs, and improve customer satisfaction.

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