

Driving Profitability at the Execution Layer:

*How a Common Platform Can
Improve the Bottom Line*

Overview

Automation technology is driving increased efficiency in today's manufacturing and distribution environments, but companies often fail to achieve maximum benefits from these investments in one key area: creating actionable information to support real-time business and operational decision-making. It's a story that's all too common—and one that is eroding profitability.

Does this Sound Familiar?

The GM is forced to estimate the production status of an important order because he/she lacks visibility into the manufacturing process. Unfortunately, the estimate or "best guess" is inaccurate, and the resultant order delay causes the disappointed customer to cancel future orders. Thus, a faulty decision based on inadequate data hurts the company's bottom line.

However, if the company had been using a common information platform based on Acsis xDDI, the manager could have given a fast, accurate response to the customer's request. Or better yet, Acsis xDDI would have enabled the company to make prior process improvements for a faster, more streamlined production process so instead of reporting order delays, the company would have met or even exceeded its customer's expectations.

Does the above scenario hit a bit too close to home for you? Despite having implemented sophisticated shop-floor automation technology, many operations and business executive managers lack instant access to the data they need to make informed decisions. While the flow of timely, meaningful information is essential for efficient operations, data that is delayed or unavailable can hinder your company's ability to respond to supply-chain problems.

In addition, disconnected "islands of information" often exist in the manufacturing operation and at various nodes throughout the value chain.

Indeed, your company may be feeling the impact of this "information disconnect" in several areas that ultimately affect your ability to deliver optimal customer service. For example, a seemingly simple task, such as updating customers on their order statuses becomes difficult when you cannot easily locate the related components within the manufacturing queue. On the distribution side, errors caused by poor visibility and inadequate tracking can result in finished goods being lost or misrouted, which almost always leads to very unhappy customers.

Attempts to re-engineer or incrementally improve production processes often stagnate because the data does not exist or cannot be easily retrieved and analyzed. A lack of actionable information also impairs efforts to improve value chain efficiency and prevent supplier problems before they occur. Finally, management personnel at all levels often lack sufficient data to support decisions related to manufacturing capacity, cycle times, or product mix.

How Connected Are Manufacturing Execution Systems?

AMR Research, the leading advisory firm focused on the intersection of business processes with supply-chain and enterprise technologies, reported in 2006 that, although global manufacturers require profitability insight by SKU, order, real-time costing, and predictive analytics to support successful enterprise sales and operations planning decisions, more than 90% of shop-floor devices remain disconnected from ERP systems. Additionally, global manufacturers emerge from ERP rollouts only to discover that manufacturing is the weak link in their supply networks.

¹ AMR Research, Inc. *SOA on Steroids: The Reality of Manufacturing Composite Applications*. October 12, 2006.

What's Happening on the Shop Floor?

The truth is, these issues which often span the enterprise result from unavailable or inadequate information or from data that can only be compiled through time-consuming, error-prone manual processes. What's more, the deficit

touches many aspects of a company's operation and can ultimately have an insidious effect on profitability. The following table highlights some common signs that it may be time to rethink your shop-floor automation strategy:

Problem	Underlying Issue	Impact
Strategic Business Management		
There is a lack of accurate manufacturing, distribution, and/or supply-chain data to drive strategic decisions.	Information is not being captured on the shop floor or through distribution channels.	Management receives only a partial subset of the needed information.
	Data is available, but harnessing it is inefficient and incurs additional costs.	The costs associated with securing necessary information actually outweigh the associated benefits.
Customer Service		
Customers and/or the government require product tracking and traceability.	Current systems do not support track-and-trace capabilities.	More headaches emerge from the addition of yet another separate point solution to the existing MES.
Customers want to check order status.	Current systems do not support track-and-trace capabilities of customer orders in manufacturing and/or distribution pipelines.	
Manufacturing		
Operations managers want to improve shop-floor efficiency and optimize order flow.	Manufacturing processes cannot be integrated with an ERP system.	Management has little or no visibility into the execution layer.
	There is insufficient data to uncover and connect operational issues.	
	Excessive time and effort is expended to keep all manufacturing systems up and running.	There are no time or resources to seek process improvements.
Supply Chain		
Supply-chain managers want to resolve and more ideally, prevent supply-chain problems.	The ability to recognize and respond to value-chain problems in a timely manner is severely compromised, because data access is limited.	Response to suppliers is slow and incomplete.

The root cause of the above issues is that islands of automation and information exist at the shop-floor level—and by definition, these standalone systems lack horizontal integration. Shop-floor applications, which are typically comprised of specialized devices and point solutions, have unique requirements. These applications require the orchestration of various activities across manufacturing operations and into the supply-chain and distribution channels. Plus, real-time data capture and integration are needed to both provide management the visibility it requires and enable continuous improvement. And, the need to reflect and respond to event triggers from and to SAP (or other ERP system) further complicates the process.

But, what if you could leverage the data generated at each step of the manufacturing process often in geographically dispersed locations and integrate it into your ERP system and throughout the value chain?

The Common Platform as Business Enabler

The solution is a common technology platform for automation that resides on the shop floor and provides an enhanced level of horizontal integration across the silos of information that exist in disparate devices and systems. The platform must include pre-built device maintenance and advanced workflow management capabilities. In addition, standards-based integration capabilities are required to reduce the amount of effort to integrate new and existing shop floor systems with each other and with core business systems, such as enterprise resource planning (ERP) applications. The common platform allows individual systems to function independently while aggregating and integrating the data from those systems—and enabling the continuous, real-time, bi-directional flow of that data to and from ERP systems, such as SAP.

Common technology platforms for automation offer a number of benefits. Integrating the data stream helps companies to better align their operations with business goals and to break down silos that often exist between manufacturing, engineering, finance, information technology, and supply-chain management departments. Further, improved data availability helps organizations to respond to new business requirements and resolve manufacturing challenges far more quickly than before. Better yet, horizontal integration even allows external suppliers to link with their partners' supply-chain processes.

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A common platform also helps your business meet today's needs while positioning your infrastructure to quickly grow and adapt for future expansion including the rapid, standards-based implementation of new processes. End-to-end integration of real-time information from your supply chain through the manufacturing and distribution stages gives you the understanding you need to prevent supplier problems before they surface and to analyze details without losing sight of the big picture.

In the absence of a common automation platform, your manufacturing team is required to expend significant time and effort in supporting individual systems. However, a common platform reduces this effort and provides them with the added benefit of the visibility to see patterns throughout the manufacturing and distribution cycle and to act upon this information to make operational improvements.

And if your industry is subject to regulatory or retail track-and-trace mandates, a common platform can yield business advantages beyond mere compliance, such as protection from product loss and misrouting, as well as granular retail data that can drive product mix decisions.

In other words, a common platform can help your company connect the shop floor to the top floor and reap all of the benefits that go with full enterprise integration. These include many, if not all, of the high-level goals you are no doubt struggling to achieve, such as real-time decision making, supply-chain agility, operational efficiency, and regulatory compliance.

A “Middleware Plus” Checklist

The term “middleware” is used to describe products that serve as the glue between two applications and it is sometimes called plumbing because it connects two sides of an application and passes data between them.

Tech Encyclopedia defines middleware as “software that functions as a conversion or translation layer, enabling one application to communicate with another, that either runs on a different platform or comes from a different vendor or both.”

And while virtually all manufacturing execution layers certainly include middleware today, they require so much more. When based on a common technology platform, the execution layer can provide important operational gains that extend far beyond “plumbing.” If you answer in the affirmative to three or more of the following questions, you probably need to consider something more. And, we call that something “middleware plus.”

- Are you struggling to make timely business decisions because of the inability to gather and analyze data from disparate sources?
- Are the systems you have in place disconnected or installed to solve specific point problems, making it tough to gather the enterprise-wide data you need? Is it only getting worse as new customer demands—such as RFID and compliance labeling—are forcing you to look at implementing even more separate point solutions?
- Do you spend all your time “keeping systems running” and find yourself with zero time to look at the bigger picture or focus on finding ways to improve shop-floor operations?
- Do you struggle to respond to supply-chain problems in a timely fashion, because you don’t have access to appropriate data soon enough?
- Do your customers complain that you can’t tell them the status of their orders or provide other basic information?
- Is it hard to make improvements to your shop-floor processes, because you have insufficient data to understand where the real issues are?
- Do you find—or believe—that you have blind spots when it comes to the flow of orders through manufacturing?

Acsis xDDI is a Common Platform

With functionality and business benefits above those of traditional middleware, the Acsis eXtended platform for Device and Data Integration (xDDI) offering provides a comprehensive platform for fully integrated business process automation and data collection. Specifically, Acsis xDDI orchestrates manufacturing and distribution activities at the execution level while providing continuous, real-time and bi-directional data exchange between disparate systems and SAP—and across the value chain. xDDI also serves as the foundation for several pieces of manufacturing-specific functionality, including serialized track and trace, ERP integration, and enterprise-wide product labeling and bar coding.

This powerful middleware plus capability means that xDDI can help your company to coordinate and orchestrate your devices, equipment, human activities, and enterprise information, often resulting in dramatic productivity gains. By integrating and filtering critical data no matter what the source or collection method the xDDI platform facilitates real-time business decisions and processes.

All of this is possible because xDDI works with and also extends existing SAP resources, data, and systems in real-time using SAP's Enterprise Services Architecture (ESA) standards. With xDDI, your company can integrate live process events with SAP's services, SAP xMII, and other devices and systems, such as forklift VMU, line HMI, and handheld PDAs. Moreover, the ability to create, collect, and present comprehensive value chain data means you can monitor, alert, and report along your manufacturing and distribution channels in ways you never dreamed possible—and at the speed of normal operations.

Achieve Big Benefits for Your Business

At the highest level, data generated through Acsis XDDI helps to drive strategic decisions by facilitating executive visibility into manufacturing and distribution processes that enables dynamic response to changing business conditions.

Additional benefits, such as faster cycle times due to a newfound ability to see and eliminate lags between processes, can be readily quantified and are often sufficient to justify the investment in a common platform. And at an even more tactical level, Acsis xDDI automates information flow between processes that previously required manual help. By reducing or even removing the need for human intervention, data from these tasks flows in real time and there are fewer product and process errors and associated rework.

In other words, Acsis xDDI can help organizations meet the demands placed on them by the business, specifically enabling companies to:

- Rapidly respond to new strategic requirements
- Develop solutions quickly
- Align manufacturing and warehouse operations with management goals
- Break down existing silos between plants, data centers, and business operations to easily support the flow of information between shop-floor operations and business operations
- Enable external suppliers and service providers to fully integrate with supply-chain processes

Key Features and Benefits of Acsis xDDI

Acsis xDDI Function	Business Benefits
<p>Device Management: Rapidly integrates RFID readers, PLCs, weigh scales, optical sensors, and barcode readers. The platform is designed to support all current and future data collection and shop-floor device technologies.</p>	<ul style="list-style-type: none"> • Leverage existing investments in fixed and mobile equipment. • Improve customer satisfaction with accurate production estimates and real-time order status capabilities. • Facilitate labeling, barcoding, and RFID track-and-trace capabilities to support government regulations and customer mandates.
<p>Services Integration: Automatically links receiving, moving, manufacturing, and shipping processes as repeatable services.</p> <p>Integrates operations data in real time with SAP for manufacturing visibility and analytics.</p>	<ul style="list-style-type: none"> • Maximize investments in existing business logic while allowing for rapid response to future changes. • Optimize production, packaging, and distribution processes and workflows. • Improve data accuracy while eliminating manual data entry and its inherent errors. • Balance operational level autonomy with ERP interoperability for processes and data.
<p>Process Work Flow: Through SAP's ESA, integrates shop-floor devices and activities with existing business level logic for an end-to-end shop floor process automation solution.</p>	<ul style="list-style-type: none"> • Gain up-to-the minute visibility into production, shipping, and inventory processes for informed, proactive business decisions. • Standardize operating procedures and apply best practices across the enterprise. • Automate the flow of production and warehouse transactions into SAP. • Reduce staff or redeploy employees to higher value tasks. • Optimize SAP ERP investments, including those in xMII, All, XI, and mySAP.
<p>Data Services: Protects the manufacturing shop floor from wide area network or ERP outages through a highly efficient system that replicates and maintains mission-critical data.</p>	<ul style="list-style-type: none"> • Ensure high availability of data collection and process automation. • Maintain data security and help keep systems up and running even if backend systems are unavailable.

Conclusion

Shop-floor data provides the basis for top-floor information and decisions—decisions that are, in turn, needed to refine and improve shop-floor execution. But too often, manufacturing and distribution environments consist of an array of operations and devices that cannot efficiently share information horizontally and with the business operations layer. That's why a common execution platform that helps organizations connect the shop floor to the top floor is essential. End-to-end connectivity throughout the enterprise and across devices and silos of information is the foundation for smarter, faster decision making, enhanced supply-chain agility, greater operational efficiency, and effective compliance with government regulations and customer mandates. In fact, information generated through shop-floor-to-top-floor integration provides the foundation for more informed business conclusions, greater shop-floor efficiencies and process improvements, and quick resolution to supply-chain problems.

How Acsis Can Help

Acsis, Inc. is ready to help your company improve its bottom-line profitability through integration and orchestration of activities at the manufacturing and distribution execution layer. Developed to complement SAP's ESA strategy and a direct result of the Acsis business consulting heritage, the xDDI platform boasts a unique place in the industry. Offering unprecedented enterprise-wide scalability, affordability, and flexibility, Acsis xDDI also acts as the basis for a host of industry-leading solutions, including:

- Acsis Label Management Solution
- Acsis Pharmaceutical Serialization Solution
- Acsis Serialized Product Track and Trace Solution
- Acsis Automated Data Collection Solutions
- Acsis Container Tracking Solution
- Acsis Manufacturing Efficiency Solutions
- Acsis Supply Chain Efficiency Solutions

Moreover, Acsis supports xDDI with robust professional services that leverage our recognized expertise in shop-floor automation and more than 10 years of experience integrating SAP with a variety of manufacturing systems, processes, and applications to help you identify and address your real-world manufacturing and distribution problems.



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Document #XXXX-XX