THE UNIFIED MANUFACTURING ENVIRONMENT: TRANSPARENCY, COLLABORATION, AND DECISION-MAKING WITH END-TO-END ERP

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Report Highlights

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The top challenges facing manufacturing stem from a lack of visibility.

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Leading manufacturers are 2.2 times more likely to have an end-to-end manufacturing ERP solution.

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Manufacturers with complete ERP are 2.3 times as likely to have the ability to share and integrate data with the extended enterprise.

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Manufacturers with complete ERP are 52% more likely to have real-time visibility into the status of all processes.

This report identifies both the similar and different benefits of an end-to-end ERP package for process and discrete manufacturers.

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Supplementing ERP software with applications designed to help automate the various disciplines in a manufacturing organization can not only be more expensive, but also make it difficult to access a single version of the truth, to communicate and collaborate effectively, and maintain compliance. For this reason, many manufacturers lack true visibility across their operations and cannot effectively make decisions that grow the business.
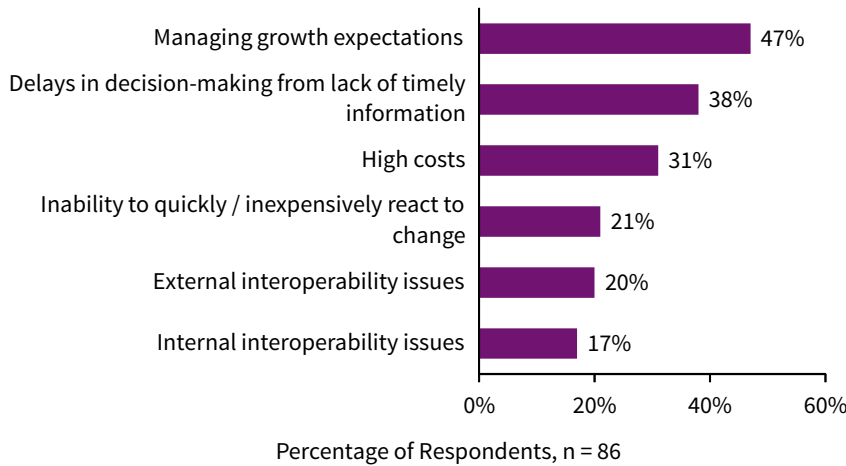
As manufacturing organizations grow more complex, offer more products, service more customers, utilize more suppliers, and operate in more locations, they typically rely on a more flexible and robust technology environment. But while a larger technology footprint can bring essential functionality for managing manufacturing operations, it can also bring a whole new set of problems. Supplementing Enterprise Resource Planning (ERP) software with applications designed to help automate the various disciplines in a manufacturing organization can not only be more expensive, but also make it difficult to access a single version of the truth, communicate and collaborate effectively, and maintain compliance. For this reason, many manufacturers lack true visibility across their operations and cannot effectively make decisions that grow the business. This is why top performing manufacturers are 2.2 times as likely to implement an ERP package that contains the functionality that was previously provided by multiple, disparate systems in one package. This enables capabilities including improved collaboration, agile decision-making, efficiency, and quality while improving ERP return on investment. How can your organization benefit from a solution like this? This report identifies both the similar and different benefits of an end-to-end ERP package for process and discrete manufacturers.

Today's Challenges

In a survey conducted for Aberdeen's *Creating a Modern, Effective Manufacturing Environment*, manufacturers were asked to select the "top two" challenges facing them today (Figure 1).

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Figure I: Manufacturers Challenged with a Lack of True Visibility

Managing growth expectations — 47%
Delays in decision-making from lack of timely information — 38%
High costs — 31%
Inability to quickly / inexpensively react to change — 21%
External interoperability issues — 20%
Internal interoperability issues — 17%

Percentage of Respondents, n = 86

Source: Aberdeen Group, August 2014

Ultimately, the challenges that they are facing can all be linked to a lack of visibility into essential data needed to run their organization. For example, the number one challenge that manufacturers face today is "managing growth expectations." When managing growth, importance is added to every decision, employees become removed from each other (functionally and physically), and the organization is exposed to more potential sources of data. Unfortunately, 38% indicate that they face delays in decision-making from a lack of timely information. Without easy access to data, the organization cannot effectively keep costs low, react to changes in an agile manner, and collaborate internally and with the extended enterprise. Even if an organization has access to different types of manufacturing software, this lack of timely access to information could be linked to the fact that their technology environment is not effectively connected.

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In Aberdeen's Manufacturing Operations Benchmark Study, **discrete** manufacturers were asked to indicate their "top two" strategies:

- Promote visibility between manufacturing operations and the enterprise: **45%**
- Promote collaboration between product design and manufacturing: **44%**
- Increase focus on Lean and operational excellence initiatives: **39%**
- Improve the efficiency of manufacturing operations: **34%**
- Promote collaboration and coordination with the supply chain: **30%**

In Aberdeen's Manufacturing Operations Benchmark Study, **process** manufacturers were asked to indicate their "top two" strategies:

- Promote visibility between manufacturing operations and the enterprise: **49%**
- Improve the efficiency of manufacturing operations: **46%**
- Promote collaboration between product design and manufacturing: **40%**
- Increase focus on Lean and operational excellence initiatives: **29%**
- Build compliance and traceability into production processes: **27%**

Process or Discrete: Lack of Visibility Impacts Strategy

Aberdeen's Manufacturing Operations Benchmark Study identified the top strategies of both process and discrete manufacturers. Both sets of strategies could be significantly improved by implementing a single version of the truth featuring all of the functionality needed to run a manufacturing organization from end-to-end. While most of the strategies are quite similar, there are some differences that display the unique qualities of each type of manufacturer.

In the case of discrete manufacturers (see sidebar), there is more of a focus on efficiency and collaboration. The number one strategy of discrete manufacturers is to promote visibility between manufacturing operations and the rest of the organization. In this case, a typical goal is to improve communication between product design and manufacturing. When this happens, manufacturing operations can communicate the manufacturability of designs made by product development, or product development can better communicate what final products are supposed to look like. And this communication is not only intended to happen internally. When communicating with the supply chain, organizations can do a better job of demand planning and can secure better prices for materials.

Additionally, discrete manufacturers place significant focus on creating efficiency. They must uncover ways to make quicker decisions, as well as do more with less. This would be impossible without a greater understanding of what is going on across the organization.

Process manufacturers place a similar focus on efficiency (see sidebar), but there is one specific area where visibility can support improvements in strategy. This exists in the strategy to build compliance and traceability into production processes. In

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order to be successful, process manufacturers must know where their materials come from, how they are composed, and where their products go. This is to ensure the quality and consistency of their products as well as to adhere to the various regulatory requirements, such as the Food Safety Modernization Act, that they are subject to. In a current environment, recipes, rules, and material and supply information may be located in different systems. This is unacceptable for enforcing this essential strategy.

All-in-One ERP

ERP has long been an essential part of a manufacturing organization. In fact, it is near ubiquitous. According to Aberdeen's _Creating a Modern, Effective Manufacturing Environment_, 97% of manufacturing Leaders have ERP, in comparison to 88% of Followers. But for many manufacturing organizations, their ERP solution is not the end of their technology environment. These manufacturers supplement ERP with solutions designed to add functionality essential for running different parts of the organization, from the plant floor, to product design, supply chain, finance, and beyond. Unfortunately, these solutions may not be effectively connected. This can lead to inaccurate, outdated information and can require additional work while putting the organization at risk related to regulatory reporting. But it doesn't have to be this way.

Instead, the most successful organizations have ERP solutions that provide a greater amount of modules providing functionality across the organization. Note that Leaders are more likely to have a variety of modules contained within their ERP solution out of the box, which provide end-to-end manufacturing functionality (Figure 2). These modules include, but are not limited to, manufacturing automation, supply chain

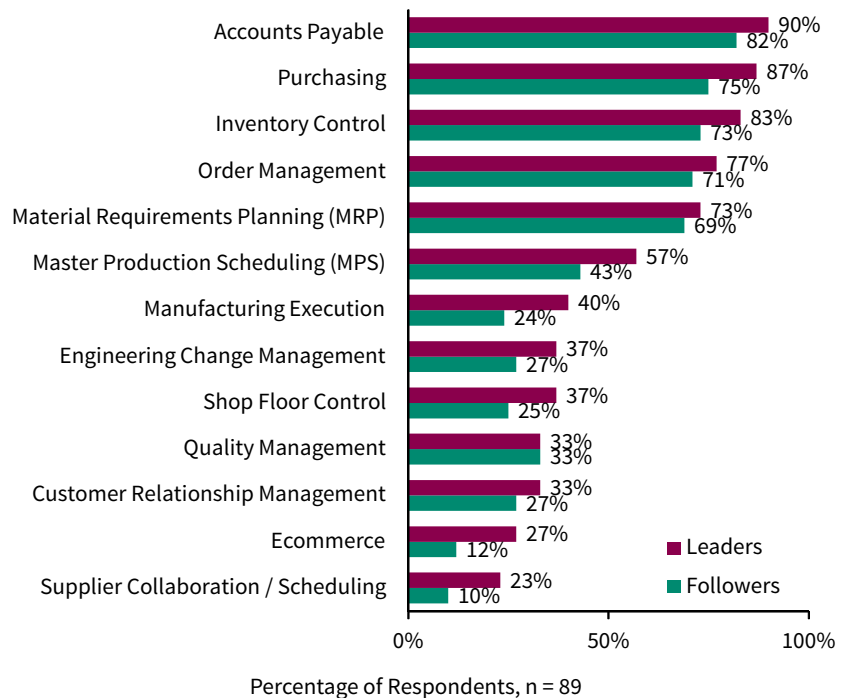In this report, Aberdeen groups respondents into two maturity classes:
- **Leaders:** Top 35% of respondents based on performance
- **Followers:** Bottom 65% of respondents based on performance

In Aberdeen's _Creating a Modern, Effective Manufacturing Environment_, respondents were ranked on the following criteria:
- **Complete and on-time delivery:**
    - Leaders - 96%
    - Followers - 82%
- **Improvement in profit margins over the past two years:**
    - Leaders - 14%
    - Followers - 4%
- **Internal schedule compliance:**
    - Leaders - 93%
    - Followers - 81%
- **Inventory accuracy:**
    - Leaders - 97%
    - Followers - 87%

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management, quality management, customer relationship management, order management, and financials. Now, these top performers can capture, track, and report on information gathered at the "manufacturing moment" leading to efficiency, agility, and optimization. There is no need to have a master data management strategy to keep disconnected data sources in sync, because they are already connected.

Figure 2: Leaders Have a True Full Package

Category	Leaders	Followers
Accounts Payable	90%	82%
Purchasing	87%	75%
Inventory Control	83%	73%
Order Management	77%	71%
Material Requirements Planning (MRP)	73%	69%
Master Production Scheduling (MPS)	57%	43%
Manufacturing Execution	40%	24%
Engineering Change Management	37%	27%
Shop Floor Control	37%	25%
Quality Management	33%	33%
Customer Relationship Management	33%	27%
Ecommerce	27%	12%
Supplier Collaboration / Scheduling	23%	10%

Percentage of Respondents, n = 89

Source: Aberdeen Group, August 2014

Use Cases: Complete ERP

Aberdeen has identified the manufacturers that it would consider as using a "complete ERP" solution, which contains the functionality needed to run an end-to-end manufacturing organization and provide true visibility. We isolated respondents that had ERP with modules for CRM, production scheduling, manufacturing execution, order management, and purchasing

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and compared them to organizations with ERP with less functionality. When comparing them, it becomes apparent that a complete ERP can lead to a more effective manufacturing organization.

For example, complete ERP improves a manufacturer's ability to support the strategy of improved collaboration (Figure 3). Not only are they fully able to share information across functions internally, but organizations with complete ERP are also better able to collaborate outside of the organization. In fact, manufacturers with complete ERP are 2.3 times as likely to have the ability to share and integrate data with the extended enterprise. With seamless Electronic Data Interchange (EDI), manufacturers can work better with trading partners to improve demand planning, reduce inventory, and secure better prices for materials. On the other end, the organization can better communicate with customers in order to ensure that they get the right products when they need them.

Figure 3: Collaboration from the Plant Floor to the Top Floor and Beyond
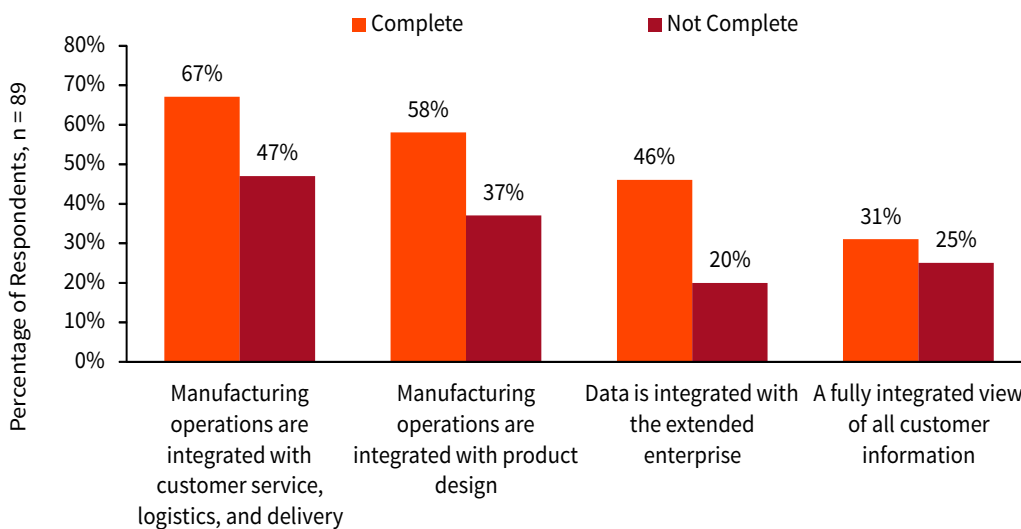
Source: Aberdeen Group, August 2014

Next, complete ERP helps to support the strategy of improving
visibility and traceability into materials. These capabilities are
particularly important to process manufacturers, but
manufacturers of all types can benefit from them. Note that
manufacturers with complete ERP are 52% more likely to have
real-time visibility into the status of all processes (Figure 4). This
is essential for all manufacturers in order to make agile,
informed decisions, as well as to maintain efficiency.

**Figure 4: Enabling Quality and Compliance in a
Comprehensive Solution**
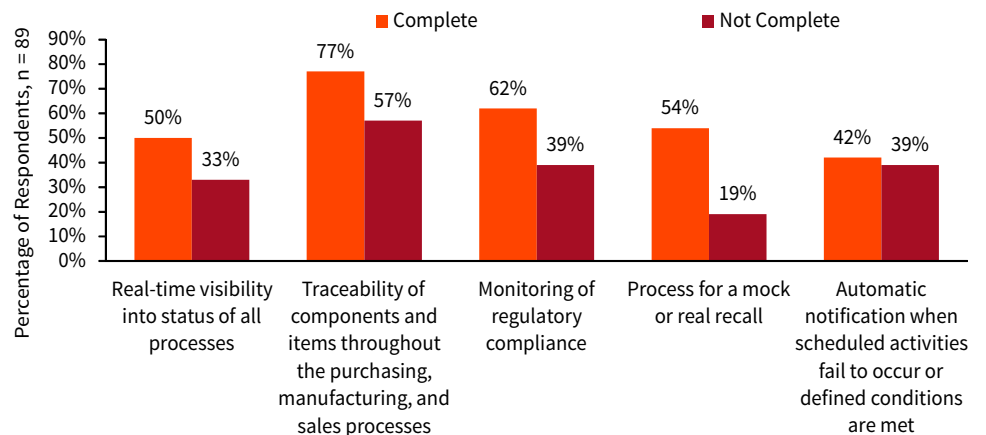

Source: Aberdeen Group, August 2014

But for process manufacturers, 77% of those with complete ERP
have traceability of components and items throughout the
purchasing, manufacturing, and sales processes. All material
information can therefore be traced both upstream and
downstream. Not only can monitoring where materials come
from and how long it has been since they originated help to
ensure quality, but this is also essential for maintaining
regulatory compliance. Of course, there are cases where there
will be problems with materials that occur after they have left
your organization's hands, which is why manufacturers with
complete ERP are 2.8 times as likely to be able to execute recalls.

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These can be aided by automated alerts that are based on the real-time visibility enabled by a source of truth.

Another important strategy for manufacturers today is to improve effectiveness and efficiency. This is also supported by a complete ERP solution (Figure 5). The single solution can create a one stop shop for process standards, ensuring that the entire organization adheres to best practices. But using complete ERP to enforce standards is only the tip of the iceberg when it comes to enabling excellence and efficiency.

Figure 5: A Holistic Approach to Operational Excellence and Efficiency

Source: Aberdeen Group, August 2014
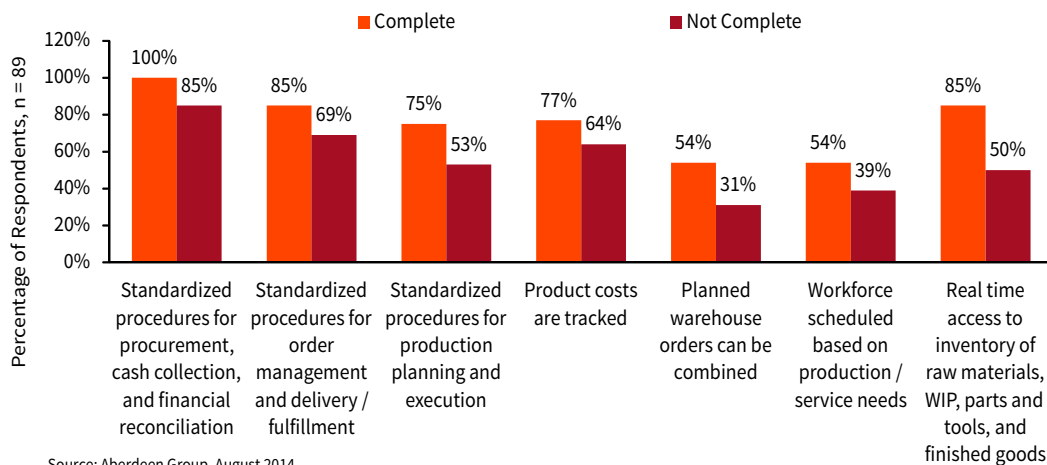
With a complete, end-to-end system, agility and decision-making become much easier. Note that organizations with complete ERP are more likely to:

- ➔ Track product costs

- ➔ More effectively manage logistics

- ➔ Schedule production and resources while monitoring resource utilization

- ➔ Access more robust inventory information

There are an infinite number of ways this information can help to improve a manufacturing organization, and it all stems from having an easy-to-use application that provides instant access to all relevant data.

In summary, complete ERP enables one complete record that can be used for decision-making that is available anywhere. This is particularly true if the solution is delivered in the cloud. Truly, 83% of organizations with complete ERP have a fully integrated system of record (Figure 6). An example of the benefits of this would be the ability to accomplish eCommerce and order management. Further, organizations with complete ERP are three times as likely to have mobile access to ERP. This can significantly improve efficiency as well as accuracy of data. For example, mobile devices can be utilized for barcoding or taking orders. With this single version of the truth, employees have access to a one-stop shop for information.

Figure 6: One Complete Record, Available Anywhere
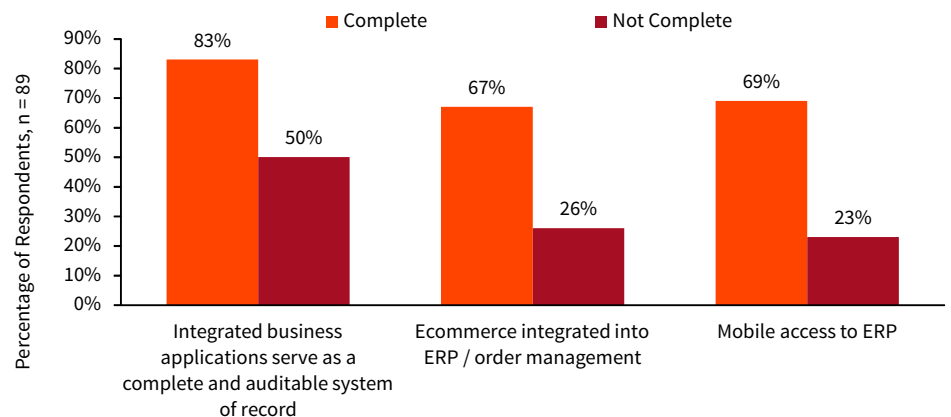
Source: Aberdeen Group, August 2014

The Results

There is proof that manufacturers with one single solution designed to fit their needs operate more effectively. Compare those with complete ERP to those without (Table 1). Those with

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complete ERP perform better across a variety of extremely important metrics, including complete and on-time delivery, schedule compliance, and inventory accuracy. Additionally, these organizations have seen recent improvements in decision-making and profitability. In fact, manufacturers with complete ERP saw an 8% improvement in profitability over the past two years.

Table 1: Improved Performance

Average Performance	Complete ERP	Not Complete
Complete and on-time delivery	91%	88%
Improvement in profitability over the past two years	8%	7%
Improvement in time-to-decision over the past year	27%	14%
Internal schedule compliance	90%	87%
Inventory accuracy	93%	92%

Source: Aberdeen Group, August 2014

Not only do manufacturers with complete ERP perform better than those without, these organizations actually see increased ROI from their ERP solution itself. Simply, more functionality leads to greater benefits. Manufacturers with complete ERP saw greater improvements as a direct result of ERP in metrics such as inventory turns, stock to sales ratio, and the cycle time of key business processes, among other metrics. This presents a compelling case for investing in a complete solution.

Table 2: Greater ROI

Percentage Improvement as a Result of ERP	Complete ERP	Not Complete
Inventory turns	48%	23%
Stock-to-sales ratio	22%	11%
Operational costs	10%	8%
Administrative costs	11%	7%
Complete and on-time delivery	15%	12%
Inventory levels	13%	8%
Schedule compliance	15%	10%
Cycle time of key business processes	20%	12%

Source: Aberdeen Group, August 2014

Key Takeaways and Recommendations

In the past, an ERP solution alone may not have addressed all of the needs of a successful manufacturer. Many organizations supplemented their solutions with other applications designed to handle the various aspects of a modern manufacturer. Unfortunately, this environment may not provide accurate, timely information and could require additional data management work and security concerns. Fortunately, some ERP vendors have designed solutions that truly provide manufacturing transparency and automation across the organization. Whether our organization is a process or a discrete manufacturer, it should heed the following recommendations in order to reap the benefits of their technology environment.

➔ **Look for a complete solution.** Leading manufacturers are 2.2 times as likely to have complete ERP. The organization can create dashboards to monitor and report on every aspect of the business.

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➔ **Connect functions to improve performance.** For example, connecting the plant floor with the back office can better help your organization to understand costs, optimize schedules, eliminate waste, and report accurately.

➔ **Utilize external information to serve customers effectively and improve relationships with suppliers.** Manufacturers with complete ERP are 2.3 times as likely to be able to share data with the extended enterprise. In these cases, the organization can react to price pressure and demand from customers as well as improve relationships with suppliers.

➔ **Monitor materials in real time to maintain quality and compliance.** For process manufacturers, this is of critical importance. The organization can avoid disaster as well as improve its standing with customers and regulatory bodies.

➔ **Promote agility through instant access to information.** No longer will your organization have to wait for reports to be compiled in order to act. It can take a much more proactive stance. Capturing data at the manufacturing moment and providing it to decision-makers is the key to getting ahead of competitors.

Complete ERP is the solution for an effective modern manufacturer.

For more information on this or other research topics, please visit www.aberdeen.com.

Related Research	
Don't Be Caught Off Guard: Proactively Manage Food Safety and Compliance with Integrated ERP; December 2014	_Improve Your Midmarket Business Operations with Cloud Applications_; September 2014
Customer-Centric ERP: Integrated Systems for Customer Satisfaction; December 2014	_Mobile ERP: Taking ERP ROI into Your Own Hands_; August 2014

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