

ERP AND MES: THE DYNAMIC DUO



ABERDEEN

The Synergies Between ERP and MES Solutions

- The market and business pressures as well as their performance metrics are well-aligned
- Enterprise Resource Planning (ERP) integration with manufacturing solutions is well-established
- Manufacturing results for Manufacturing Execution System (MES) Users vs. Non-users are significant
- The result: Get more bang for your buck from your ERP by adopting MES in your manufacturing

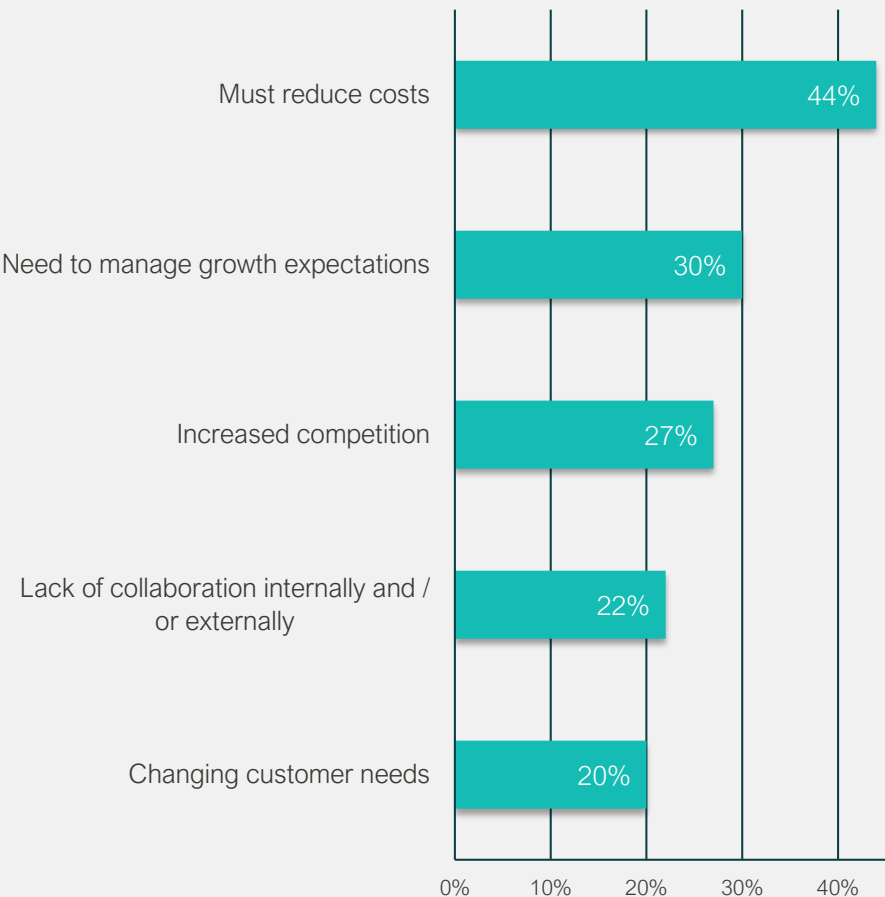
Top Market Pressures and Business Drivers

ERP & MES are Well-Aligned

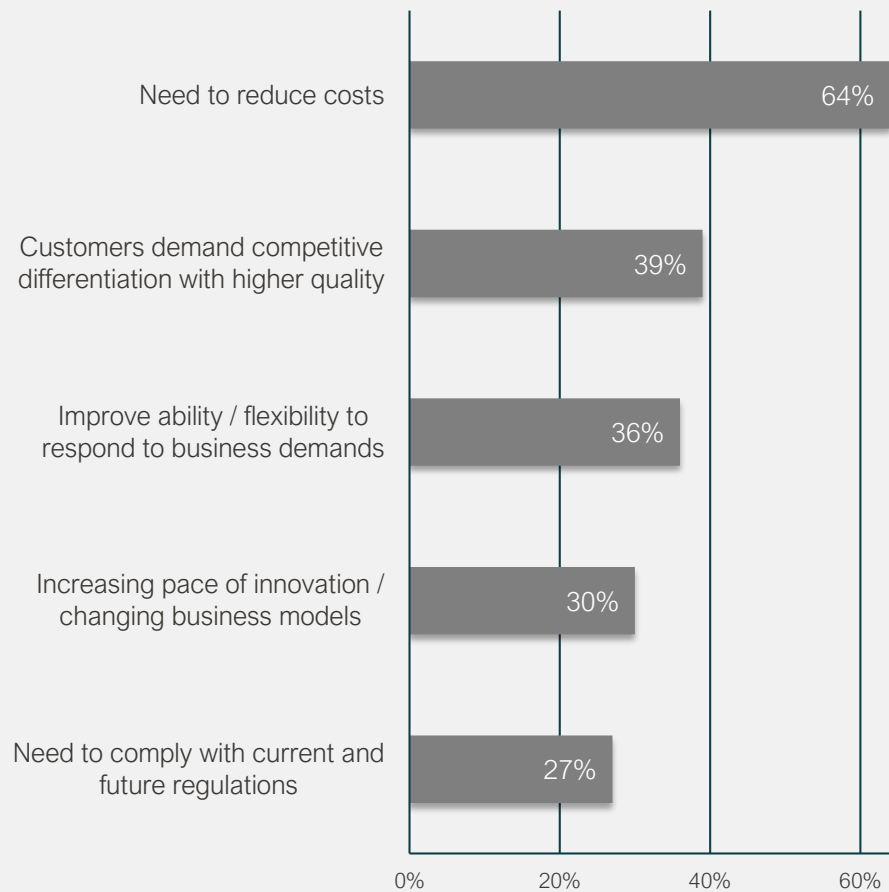
- The market and business pressures for ERP and MES are well-aligned
 - Must reduce costs vs. Need to reduce costs
 - Increased competition vs. Customers demand competitive differentiation
 - Need to manage growth expectations vs. Improve ability to respond to business demands
 - Changing customer needs vs. Pace of innovations
 - Lack of internal / external collaboration vs. Changing business models and compliance with current / future regulations

Top Market Pressures and Business Drivers: *ERP & MES are Well-Aligned*

ERP



MES



All Manufacturers

All Companies

% of Respondents, n=127, 223

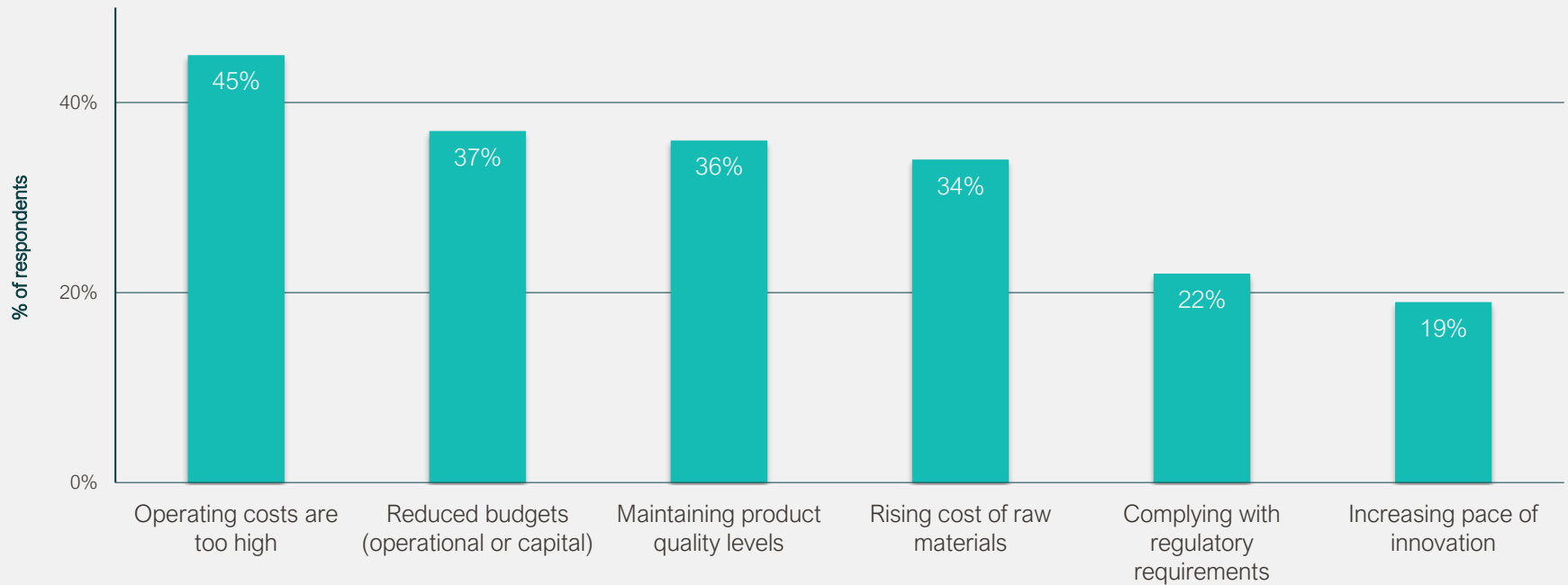
Source: Aberdeen, January 2017

Top Challenges Driving Manufacturing Behavior

➤ As Industry 4.0 ushers in the Internet of Things (IoT), the Cloud, and big data analytics, MES leverages this new influx of data, makes sense of it, and provides end-to-end, real-time process visibility and traceability, along with the ability to manage, monitor, synchronize, and optimize physical production processes.

- Pressure to reduce cost : 45% cite operating costs are too high
- Budgets are tight, but companies still need to maintain quality and regulatory compliance.

- The pace of innovation and raw-material increases create additional stress.
- Best-in-Class organizations respond to these challenges by pursuing operational excellence through MES, focusing on tracking and traceability, visibility, and quality.



All Respondents

n= 223

Source: Aberdeen, February 2017

Defining Best-in-Class Performance

Metrics are After the Same Result

➤ Shared metrics

➤ Complete and on-time shipments

➤ Productivity vs. Cycle Time and Capacity Utilization

➤ Profitability and Overall Equipment Effectiveness (OEE)

ERP

MES

Definition of Maturity Class	Mean Class Performance	Definition of Maturity Class	Mean Class Performance
<p>Leaders: Top 35% of aggregate performance scorers</p>	<ul style="list-style-type: none"> ➤ 98% Complete and on-time delivery ➤ 98% Inventory accuracy ➤ 9% Improvement in profitability over the past 2 years ➤ 13% Improvement in productivity over the past 2 years 	<p>Best-in-Class: Top 20% of aggregate performance scorers</p>	<ul style="list-style-type: none"> ➤ 98% Complete and on-time shipments ➤ 98% OEE ➤ 98% Capacity utilization ➤ 25% Improvement in manufacturing cycle time (2 years)
<p>Followers: Bottom 65% of aggregate performance scorers</p>	<ul style="list-style-type: none"> ➤ 92% Complete and on-time delivery ➤ 94% Inventory accuracy ➤ 1% Improvement in profitability over the past 2 years ➤ 3% Improvement in productivity over the past 2 years 	<p>All Others: Bottom 30% of aggregate performance scorers</p>	<ul style="list-style-type: none"> ➤ 87% Complete and on-time shipments ➤ 85% OEE ➤ 83% Capacity utilization ➤ 5% Improvement in manufacturing cycle time (2 years)

Best-in-Class Firms Achieve Superior Results

- In short, Best-in-Class companies are seizing on the MES advantage and reaping the benefits, as shown in the table
- How do they get there?
 - **Tracking and Traceability:** Best-in-Class are 50% more likely to build compliance and traceability into production processes
 - **Visibility:** For 74% of the Best-in-Class, it begins with real-time visibility into the status of all processes and manufacturing data
 - **Quality:** Best-in-Class value quality and compliance at a rate 1.9x higher than All Others

Best-in-Class Key Performance Indicator	Best-in-Class	All Others	Best-in-Class Performance Edge
Complete and on-time delivery	98%	87%	13% better
Overall Equipment Effectiveness (OEE)	99%	85%	16% better
Capacity utilization	97%	83%	17% better
Raw material utilization	96%	83%	16% better
Manufacturing cycle time improvement over 2 years	25%	5%	5x better
Operating margins improvement over 2 years	25%	5%	5x better
Time-to-decision improvement over 2 years	25%	5%	5x better

n= 223

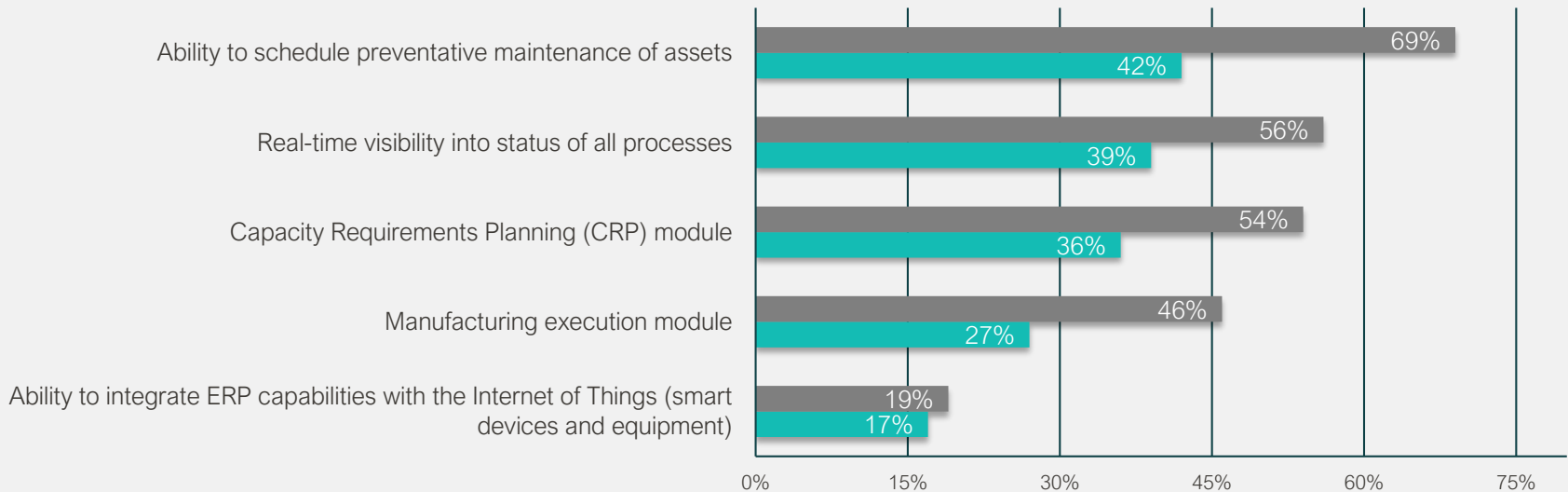
Source: Aberdeen, September 2017

ERP Integration With Manufacturing

ERP and MES Share Data from Many Sources

- ERP systems are tied to manufacturing at many levels and share common data across many ERP interfaces
- MES and ERP jointly have improved the following metrics by 5x over the last two years:
 - Time to decision
 - Manufacturing cycle times
 - Operating margins
- Joint integration with manufacturing
 - Scheduling of downtime for equipment
 - Capacity requirements
 - Manufacturing Execution Module
 - Real-time visibility into processes
 - Integration with IoT devices/equipment

ERP Integration With Manufacturing



Leaders

Followers

n=127

Source: Aberdeen, January 2018

The MES Performance Kick – More Bang for Your ERP Buck

Comparison of Those with MES vs. Those without MES

- Without exception, MES Users demonstrate better results across the board on every performance metric.
- There are several process metrics shown that are huge contributors to the business performance.
- Time to decision, launch dates met, quality targets met, higher capacity and utilization, and manufacturing cycle time improvement are direct contributors to cost reductions, complete and on-time shipments, and OEE numbers.
- Manufacturing numbers reflect 5x improvement in manufacturing cycle time improvement, and MES users are responsible for 2x, or 40%, of the improvement.
- Get the MES performance kick for your organization.

The MES Performance Kick – More Bang for Your ERP Buck

Comparison of Those with MES vs. Those without MES

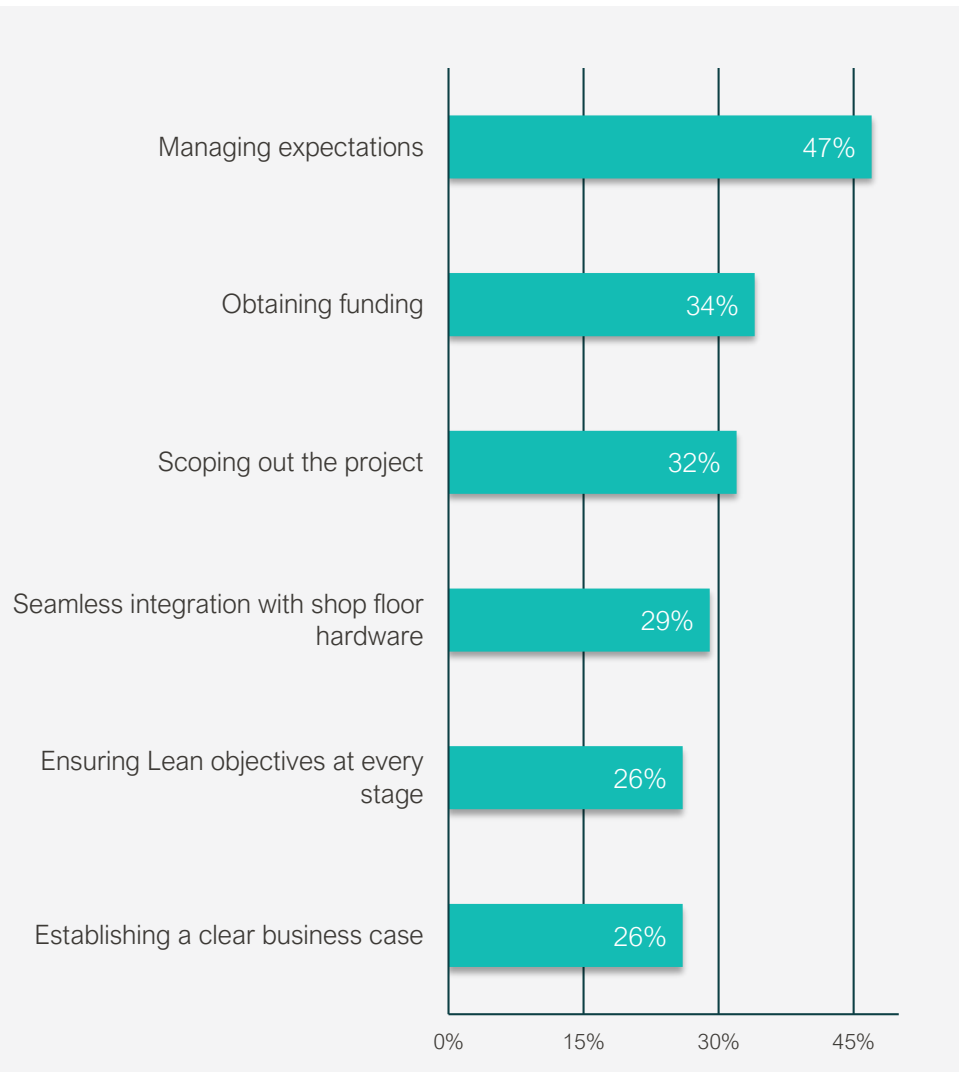
	Key Performance Indicator	MES Implemented	MES not Implemented	The MES Edge
Production	Complete and on-time shipments	92%	87%	6% better
	OOE	90%	85%	6% better
	Capacity utilization	90%	84%	7% better
	Raw material utilization	89%	85%	5% better
Product (% of products)	Product launch dates met	73%	68%	6% better
	Product cost targets met	70%	67%	4% better
	Quality targets at design release met	75%	67%	12% better
	Product revenue targets met	70%	65%	8% better
Business (over past 2 years)	Time-to-decision improvement	12%	6%	2.3xbetter
	Operating margin improvement	13%	6%	2.2x better
	Total cost-per-unit improvement	12%	6%	2x better
	Manufacturing cycle time improvement	14%	7%	2x better

n= 223

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Source: Aberdeen, September 2017

Best-in-Class MES Implementation Hurdles



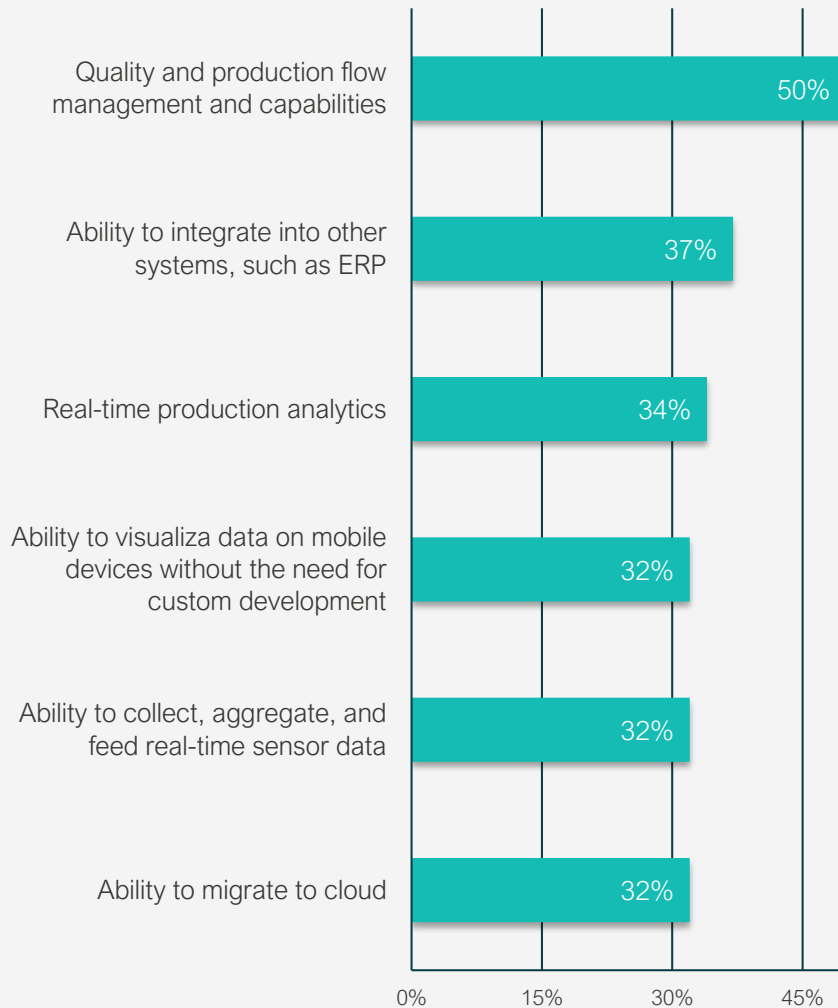
- It's no mean feat to achieve such results: MES Users have overcome many management and technical challenges to eke out these hard-won gains.
- On the management side of the house, Best-in-Class organizations have painstakingly focused on managing expectations (47%).
- Also, to obtain MES project funding, the Best-in-Class have focused on establishing a clear business case, determining clear governance, and establishing proper project scope.
- After the management hoops, technical issues predominate. The MES system must feature seamless integration with both shop-floor hardware and enterprise applications, while ensuring Lean objectives at every stage.
- Only then can Best-in-Class organizations pass acceptance testing and deploy their MES system in a production environment.

■ Best-in-Class

n=223

• Source: Aberdeen, February 2018

Best-in-Class MES Capabilities



- When it comes to success drivers, capabilities are where the story usually lies, and MES is no exception.
- The capabilities most highly prized relate to quality and production-flow management.
- Best-in-Class companies benefit and share success through integration into enterprise applications such as ERP.
- They also have real-time production analytics and out-of-the box data visualization on mobile devices.
- They have the ability to migrate to the cloud, which can assist in the integration and sharing of information across the enterprise.

■ Best-in-Class

n=223

• Source: Aberdeen, February 2018

Conclusions / Recommendations

MES is Not an Option for Manufacturing - It's a Requirement

Despite their considerable success in achieving operational excellence through MES, the Best-in-Class are not finished. They have begun their journey to Industry 4.0, and MES is a key part of that journey, especially as it relates to the cloud and Industrial IoT.

As Best-in-Class managers move towards IoT-connected equipment in the plant, MES turns out to be more important than ever as the unifying force to bring together all production information in real time.

How to Prepare

To meet the pressures of cost reduction and higher quality, Best-in-Class manufacturers are turning to MES as a better strategic path to operational excellence, and have achieved superior results. They are developing MES capabilities for better quality, production flow management, enterprise application integration, real-time production analytics, and data visualization on mobile devices. Implementing these capabilities yields increased operations speed; higher asset uptime and efficiency; improved visibility, agility and responsiveness; and improved safety.

How this Helps Your Organization

Best-in-Class organizations deploy MES and receive a performance boost for doing so. As we enter the era of Cloud and Industrial IoT, the Best-in-Class are better positioned than All Others to reap the benefits of MES – including improved operational efficiency, faster decision making, improved tracking and traceability, improved visibility into the factory, and better quality.