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Manufacturing in Turbulent Times

- In uncertain economic times, manufacturers find themselves in one of two positions. Some find themselves in a high-growth posture despite the economic turbulence, while others scale back, taking a more cautious wait-and-see approach. Both are waiting for market volatility to subside, revealing how they should utilize their manufacturing resources.

- Until global market swings become both less violent and less frequent, manufacturers should take steps to increase agility and decrease complexity by adjusting their ERP strategy.

- This paper describes the challenges manufacturers face with their legacy ERP systems and actions they can take now to better position themselves to capitalize on opportunities regardless of how long current market instabilities last.

Executive Summary

The global manufacturing economy is at a pivotal crossroad. While technology and globalization have opened exciting new revenue streams and markets, they have allowed a sobering downside to sneak in behind them. Interconnectedness has led to interdependence, causing fluctuating economies on one side of the globe to send shockwaves all the way to the other. The resulting inconsistent market behavior has left manufacturing executives wondering in what direction markets are truly headed and what actions they should take now.

As is often the case, global uncertainty has divided the manufacturing sector into one of two camps. Some fortunate producers have found themselves growing despite the unpredictable economic climate, and have ramped up

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production to near-capacity. Others may be considering or have already scaled back, cautious of another prolonged downturn. Both, however, are waiting for current market gyrations to calm down, hopeful that the economic smoke will clear and the markets will reveal their true intentions. How long that may take is yet another question mark.

Regardless of which camp a manufacturer finds itself in, continued global uncertainty leaves them with one key takeaway: they must become more nimble so they can seize market opportunities.

The moment they make themselves available, and insulate their bottom lines from erratic behavior in emerging markets. One critical action they can take is to adjust their ERP strategy to increase agility, decrease complexity and leverage the benefits of cloud computing.

Where Legacy ERP Goes Wrong

External market drivers have always challenged manufacturers to find profitable solutions in the face of uncertainty. Lately, however, an internal obstacle has emerged to threaten manufacturers' profitability more than overseas fluctuations ever could: traditional ERP systems.

Legacy ERP systems, whether on-premise or simple hosted cloud, start out with good intentions. But somewhere between version 1.x and the latest-and-greatest, these digital behemoths invariably lose their way. Rather than shoring up their underlying ERP architecture to meet modern needs like cloud and mobility, they try to match their competitor's offerings, adding layer upon layer of disjointed features with little regard to how customers will actually use them.

As pressure mounts to make their true capability match their marketing brochures, they lose sight of fundamental elements like simplicity, ease of use and low total cost of ownership. The version that finally ships is usually a convoluted mess of disjointed modules and bizarre human interfaces that make end users absolutely cringe.

Make no mistake. We expect ERP to evolve into more powerful systems, taking advantage of the compute benefits Moore's Law affords. But the vast majority of legacy ERP vendors continue to run up a debt of complexity with every new version, leaving their customers to foot the bill in the following ways.

Higher IT Costs

The enterprise license fee is only the beginning of the legacy ERP money pit. Because these packages are deployed within the company firewalls or dropped onto a one-off virtual instance, data center overhead costs need to be allocated. And while companies must invest heavily in powerful servers to run their system, costs don't stop at hardware and software.

Manufacturers have to recruit, hire and train system administrators to configure, run and maintain their system. Experienced IT talent is in short supply, so retaining a team of dedicated ERP specialists sharply increases operating costs. And if any of these skilled administrators leave the company, they take all that expensive knowledge with them.

But there's a hidden cost that analysts often miss—maintaining ERP middleware. Locally-installed ERP systems operate atop a powerful database management system (DBMS) connected by complicated processes and protocols, all of which must be maintained and secured. And because manufacturing data feeds directly into the accounting and payroll systems, IT leaders must often devote their programmers' time to write, test and deploy custom integrations and workflows.

[1]White, Wendy, "Keeping the Lights On While Building Tomorrow's Foundation", Forbes.com, Aug 2015, accessed Mar 2016, http://www.forbes.com/sites/centurylink/2015/08/24/keeping-the-lights-on-while-building-tomorrows-foundation/#5ffcdd5c6179

ERP complexity is expensive. Between data center operations and system maintenance, it's no wonder that IT departments spend 70-80 percent of their budgets just keeping the lights on. Unfortunately, this leaves little time for much-needed process innovation.[1]
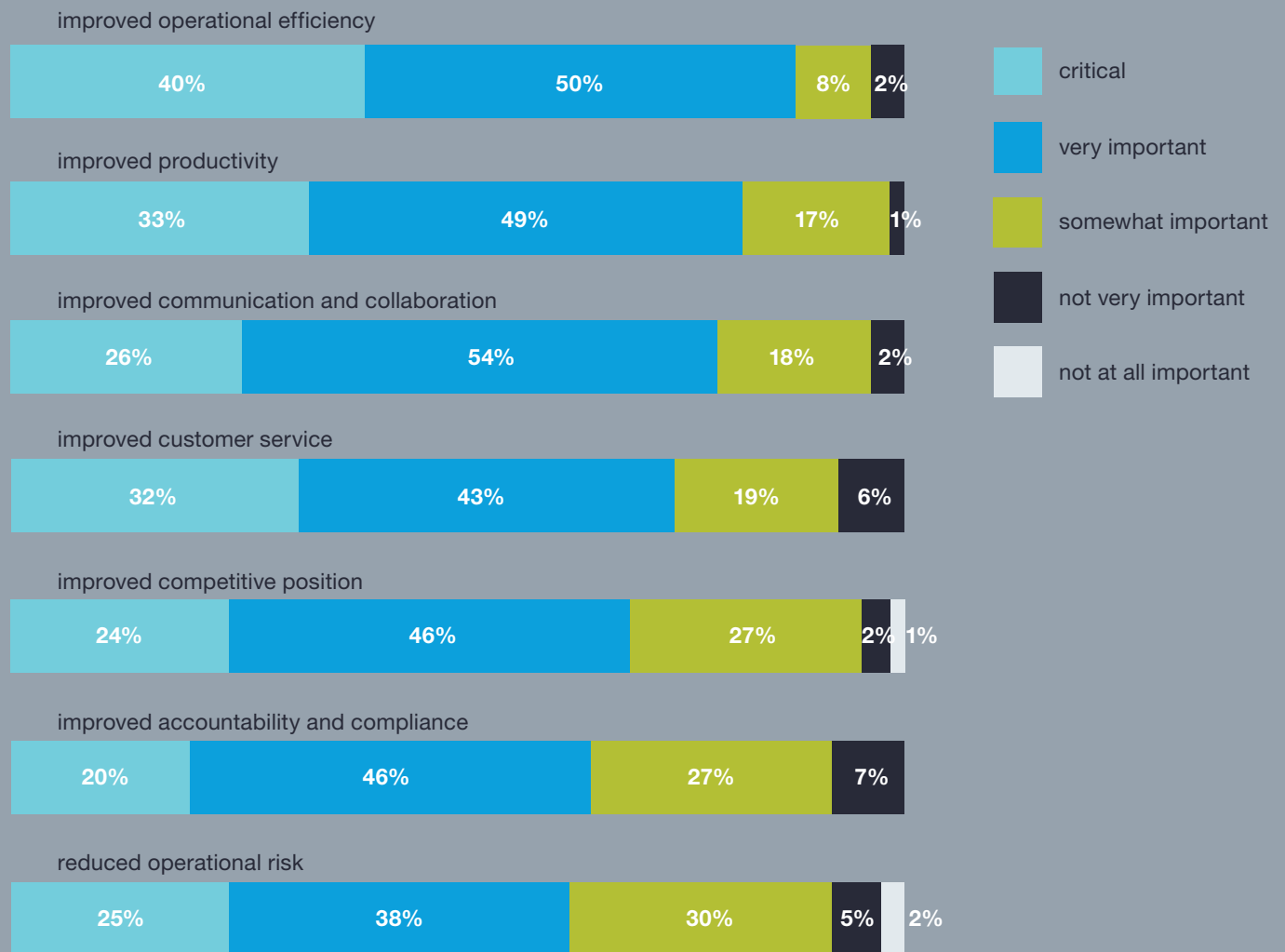
Siloed Data

A January 2016 CIO.com survey shows that system connectedness is the key to global manufacturers achieving improved operational efficiency, improved productivity and improved collaboration. However, that same survey shows that C-level executives rate their firm's level of connectedness more favorably than the workers who operate the system every day.[2] What do the line-level employees see that their leaders don't? Data silos.

Importance of Improving Level of Connectedness to Drive Business Outcomes

improved operational efficiency

critical	very important	somewhat important	not very important	not at all important
40%	50%	8%	2%	

improved productivity

| 33% | 49% | 17% | 1% | |

improved communication and collaboration

| 26% | 54% | 18% | 2% | |

improved customer service

| 32% | 43% | 19% | 6% | |

improved competitive position

| 24% | 46% | 27% | 2% | 1% |

improved accountability and compliance

| 20% | 46% | 27% | 7% | |

reduced operational risk

| 25% | 38% | 30% | 5% | 2% |

Legend:
- critical
- very important
- somewhat important
- not very important
- not at all important

Source: State of CIO Survey

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To beat their competitors in the ERP features race, most vendors cobble together "bolt-on" modules that were never designed to work together, written by developers who may have never coordinated with each other. The net result, according to Harvard Business Review, is a tangled system "so dense and extensive that it's often a miracle that it works at all."[3]

To bridge the gaps between these islands of technology, most manufacturers are forced to hire outside consultants to integrate their ERP's disjointed outputs into a data set useful enough to manage. True, further custom integration adds another layer of complexity, but without it, managers can't improve operations, nor can executives lead their companies.

Poor Visibility

Data is only useful when manufacturers can make connections between their data points to generate a clear picture of what is really happening on the plant floor. Therefore, it is crucial for ERP vendors to present managers with a 360-degree view of their entire operation on demand. But for the majority of production systems, visibility is a big, big problem.

Legacy ERP ships with substandard business intelligence (BI) modules that make it difficult for managers to perform a thorough root cause analysis. In the event of an inventory control problem, for instance, their systems can't drill down for more granular data, leaving managers to piece together outputs from a labyrinth of dissimilar screens. By the time they finally acquire all their data points they need to evaluate their options, the time for action may have passed them by. And if their inventory has a limited shelf life, the complexity could result in costly waste.

ERP should be the manager's eyes and ears to all things happening within their manufacturing operation. All too often, however, legacy systems simply can't give production leaders the data they need when they need it.

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[3]Retting, Cynthia, "Trouble with Enterprise Software", Harvard Business Review, Oct 2007, accessed Mar 2016, https://hbr.org/product/trouble-with-enterprise-software/SMR259-PDF-ENG

Too Many Manual Processes

Plant managers have long known about the benefits of going paperless. Shop floor operations of even moderate size are far too complex to run without manufacturing automation. POs get lost. Work orders get marked on. Yellow sticky notes fall off. If you're running multiple plants or geographies, paper data is invisible to other locations. And even the most efficient paper-based systems can't be indexed effectively in case of an urgent traceability need.

ERP systems are supposed to relieve manufacturers from the tedious, error-prone, paper-centric processes that a live human would otherwise have to perform. Astoundingly, however, many conventional ERP vendors completely omit commonly needed functions.

For instance, many providers don't come standard with quality control modules. Instead, they offer third-party QC components, which often drain system resources away from the core ERP when activated. EDI is another common ERP shortcoming. Some of the biggest and oldest vendors, and truly even many newer vendors offer no integrated support for this juggernaut at all. Manufacturers that need it must evaluate third-party systems themselves, or hire pricey consultants to write custom EDI applications.

The root of this problem lies in the fact that most legacy ERPs began their lives as CRM meant for sales management or financial systems meant for accounting. Then when demand dried up, they retrofitted their systems by

acquiring or partnering to handle plant floor operations and relabeled them as ERP. That's why complex on-premises systems perform so poorly on a live production environment. Their systems were never designed to handle manufacturing operations in the first place.

Hidden Costs

Few locally-installed ERP systems match a manufacturer's process model point-for-point right out of the box. Some degree of customization is inevitable. So if the customer doesn't have the programming talent in-house, they have two choices. Either change their production process to meet the shortcomings of the software or hire outside consultants to adapt the system for them. Both options are as complex as they are expensive.

Likewise, upgrading to the latest version of an on-premises ERP puts customers into a vicious cycle of hidden costs few executives anticipate.

Legacy software vendors typically charge maintenance fees from 18-30 percent of the original license price, and once true upgrade and consulting fees are rolled in, those costs can quickly balloon to 40 percent or more.

To avoid these hefty costs, many manufacturers opt to forgo the new version and keep using the old one. The jilted ERP vendor often retaliates by withdrawing tech support altogether. Some even issue their customers a non-compliance report complete with fines and fees unless they upgrade.[4]

Finally, no software vendor should penalize their customers for growing their operations. Yet, that's exactly what conventional ERP companies do whenever their clients add users. The per-seat licensing model has been a cash cow for legacy vendors for decades, with some charging as much as $4,000 per added user. And once the system is fully entrenched within the company data center, the vendor holds them hostage; they have no choice but to pay the ransom.

[4]Shepherd, Jim, "Legacy ERP Vendors Make You an Offer You Can Refuse", Plex Systems, 2015, accessed Mar 2016, http://www.plex.com/blogs/legacy-erp-vendors-make-you-an-offer-you-can-refuse.html

Conventional ERP is Broken, and There's Only One Way to Fix It

As we've seen, the sheer complexity of conventional ERP falls short on its promise to make manufacturing processes more efficient and less costly. Instead, most enterprise production systems have morphed into an uncontrolled pile of disorganized functionality. It's no wonder industry thought leader, Cynthia Rettig, describes legacy ERP as "variegated patchworks, containing 50 or more databases and hundreds of separate software programs installed over decades and interconnected by idiosyncratic, Byzantine, and poorly documented customized processes."[5]

Thankfully, technology has evolved over the past decade to relieve ERP complexity. Like many other CIOs have discovered, the lion's share of these operational complications can be overcome by leveraging the power of cloud computing.

[5]Perlman, Ellen, "What's Wrong with Enterprise Software?", CIO Zone, 2007, accessed Mar 2016, http://www.ciozone.com/index.php/SOA/What-s-Wrong-With-Enterprise-Softwareu.html

A true cloud-based ERP system reduces technical complexity and increases agility, simplifying the enterprise.

By adjusting their fundamental ERP strategy to embrace the power of the cloud, manufacturers of all sizes can capitalize on market opportunities quickly, regardless of whether they're producing near capacity or scaling back to assess uncertainty.

Operational Efficiency

Because a true cloud ERP system is delivered on demand over the web, there is no hardware to buy. The software lives in a cloud-based data center under the watchful care of the provider's system administrators. These highly trained IT professionals take care of the maintenance, upkeep, concurrency, and security issues, relieving manufacturers from high complexity costs imposed by conventional systems.

Startup time is nearly eliminated because true cloud ERP is provided natively – built in and for the cloud exclusively – as a service. Because software runs on the cloud provider's side, manufacturers can begin benefiting from the software

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sooner than they ever could with time-consuming on-premises installation. Shortening payback periods almost always results in greater production ROI.

Legacy ERP vendors complicate system access by marketing a dizzying array of role-based license options, each with its own tiered pricing structure. True cloud ERP overcomes this complexity by offering unlimited subscription levels. By giving access to more people, the company doesn't have to upgrade licenses when users change roles or get promoted.

> The cloud model simplifies costs into a more linear relationship with ERP benefits while relieving the company from frustrations of software license monitoring and management.

CFOs prefer the cloud-based delivery model. Legacy ERP requires them to record the licensing and hardware upgrades as capital expenditures (CapEx), which means they must pay a large sum up-front and reap benefits in smaller chunks over a long period of time. In a cloud-based OpEx model, however, monthly costs are smaller and benefits appear right away.

Native Connectivity

One of the biggest frustrations manufacturers endure with conventional ERP is also one of the most basic: connectivity. The hodgepodge of architectures, databases, middleware and user interfaces make a chore of even the simplest data flows.

Native cloud ERP shields manufacturers from time-devouring details of connecting dissimilar module interfaces, simplifying ERP operations at all levels by interconnecting enterprise functions like financials, order management and workflow coordination. Data flows unimpeded from the plant floor to the top floor, connecting people with processes and enhancing enterprise command and control. No need for exotic configuration changes to enable mobile access.

These powerful new cloud ERP systems have been developed for mobility from the outset to ensure that users get the enterprise-wide data they need wherever they are, regardless of device.

In the modern production firm, connectivity doesn't stop at the company firewalls. Customers, suppliers and other service providers need access to production data to streamline purchase orders and inventory shipments. Once again, cloud ERP makes short work of connecting the entire supply chain to enterprise data with seamless inter-company communication protected by powerful role-based security.

Increased Visibility

While it's true that manufacturing generates more data than any other sector, getting the right data to the people who need it has always been a challenge for legacy systems. Cloud-based ERP systems increase visibility by simplifying reporting. Through intuitive, web-based user interfaces and report designers, even the most non-technical executives can easily create reports they need to manage their entire manufacturing business.

The cloud breaks down data silos that plague conventional ERP, paving the way for analytical data to flow with fewer technological roadblocks. Report developers don't have to span multiple third-party modules for their source data; everything they need lives in the core ERP with easily accessible connection points.

Dashboards and report centers have long been a hallmark of enterprise cloud systems. Managers can see all the pertinent data they need as soon as they log in. No extra clicks or code required. By eliminating the complexity of reporting, a true cloud ERP system puts seamless real-time data into managers' hands faster, enabling them to make better and timelier decisions. The cloud also simplifies multinational plant visibility by reporting from one single source of true operating data, regardless of where on the planet it is being accessed from.

Ease of Use

Relying on third-party bolt-on modules to deliver core ERP functionality is a recipe for a sluggish, unreliable system. That's why cloud architects design every manufacturing component as a first-class citizen with all other components. And for the occasional need that can't be anticipated, architects provide intuitive API hooks for easy extensibility.

The cloud also gets manufacturers off of the upgrade treadmill. Because the entire ERP system is delivered over the web and accessed in a browser, there is no tedious upgrade process or system downtime. The cloud provider pretests and installs all upgrades on the server side, invisible to clients. The latest features will be ready to use with a simple browser refresh and, in some advanced cloud ERP solutions, an opt-in capability that allows users to enable only those features they actually want versus being forced to take features they don't want.

Cloud ERP also simplifies multi-national manufacturing as well. By presenting one centralized source of truth throughout all plants around the globe, executives, managers and line employees operate on the same real-time data set without the latency that plagues traditional systems. Under this model, multi-nationals increase efficiency, diminish redundancy and eliminate the administrative burden of database replication.

Finally, individual users benefit from the simplicity of true cloud ERP. The look and feel they experience in the plant floor module is the same one they'll see in the accounting and inventory functions. Simple and consistent human interfaces increase employee adoption while decreasing user frustration and training costs.

Plex Manufacturing Cloud - The Simple Answer to Complex ERP

The benefits of true cloud manufacturing information systems are unmistakable. The difficulty lies in finding an ERP system that delivers on the promise of operational efficiency, native connectivity and increased visibility, while shielding manufacturers from the complexity that characterizes traditional on-premises ERP systems.

Thankfully, there is such a system. The Plex Manufacturing Cloud, the first true cloud ERP solution of its kind, proves that powerful doesn't have to mean complex, and easy-to-use doesn't have to mean unproductive.

The Plex Manufacturing Cloud simplifies operations by delivering a single integrated view of truth throughout all production data.

Unlike conventional systems, Plex updates data in real time, giving companies total visibility across the enterprise from anywhere over any device. With real-time analytics underpinned by native connectivity, Plex increases plant efficiency by automating manual processes to drive down rework, lower costs and increase efficiency.

Conclusion:

Complexity is the enemy of ERP systems. Unless manufacturers take decisive action to alleviate it, complexity levels become greater over time, driving up operating costs, obscuring visibility and holding back enterprise productivity.

Before the advent of cloud ERP, manufacturers had no choice but to depend on legacy on-premises ERP systems and deal with these problems as best they could. Today, however, smart manufacturers are simplifying their operations by adopting the first true cloud manufacturing ERP system, the Plex Manufacturing Cloud.

For more information on how you can simplify your manufacturing operation, Call 855.534.8012 for a demonstration today. Or visit Plex on the web at **www. plex.com**.

About Plex

Plex is the Manufacturing Cloud, delivering industry-leading ERP and manufacturing automation to more than 400 companies across process and discrete industries. Plex pioneered Cloud solutions for the shop floor, connecting suppliers, machines, people, systems and customers with capabilities that are easy to configure, deliver continuous innovation and reduce IT costs. With insight that starts on the production line, Plex helps companies see and understand every aspect of their business ecosystems, enabling them to lead in an ever-changing market.