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ANALYST CONNECTION

Robert Parker
Group Vice President

Kimberly Knickle
Research Vice President

Manufacturers and the Cloud: Digital Transformation Beyond the Shop Floor

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The transition to "cloud also" or "cloud first" is well under way for manufacturers around the globe. The advantages are significant as line-of-business (LOB) leaders and their IT organizations increasingly rely on cloud to flexibly deliver IT resources at the cost and speed the business requires. Traditional IT spend is clearly on the decline, and manufacturers must update their cloud road maps to ensure their investments benefit the business.

The following questions were posed by Microsoft's manufacturing team to Robert Parker, group vice president at IDC Manufacturing Insights, and Kimberly Knickle, research vice president at IDC Manufacturing Insights, on behalf of Microsoft's customers.

Q. **How does adoption of cloud-based delivery in manufacturing compare with adoption of cloud-based delivery in other industries?**

A. Manufacturing is one of the most advanced industries in terms of adopting cloud. In IDC's *CloudView Survey*, only two industry segments (out of 17 total) top manufacturing in the percentage currently using cloud for one or more applications. And 95% of manufacturers expect to launch new applications and infrastructure projects in the cloud this year, according to IDC's 2015 *Vertical IT and Communications Survey* (conducted by IDC's Global Technology and Industry Research Organization). In fact, cloud computing is the top IT initiative for manufacturers.

The reasons manufacturers are adopting cloud are varied, with most manufacturers telling us that it's about giving the business more direct control over sourcing IT and improving IT productivity. More mature manufacturers recognize that cloud is not just for IT operations; cloud is also enabling the business to drive efficiencies and agility throughout its own operations and even in the way manufacturers interact with suppliers, partners, and customers. We already see that cloud adoption in manufacturing spans many types of systems — for relationships, operations, and differentiation.

Q. Can you give some more detail on the three kinds of systems?

A. *Relationship* systems tend to focus on managing external processes, usually involving finding, qualifying, and contracting with parties including customers, potential new employees, and suppliers. These were natural starting points for manufacturers when it came to the cloud; the external interaction fit the cloud model, and the processes are at arm's length with the core corporate transaction systems.

The experience with these relationship systems helped to build a comfort level for manufacturers to run core *operational* systems such as ERP, order management, and supply chain. However, companies have resisted the multitenant model of the relationship systems, giving preference to dedicated instances run on the cloud.

There has been more reluctance to move *differentiation* systems to the cloud. These systems — such as product life-cycle management and manufacturing execution systems — define a manufacturer's competitive advantage. The reasons for slower adoption vary depending on the system. Product life-cycle management software requires the movement of large files, and manufacturers worry about protecting their intellectual property. Manufacturing execution systems typically can't incur downtime, so companies feel much more comfortable keeping software and servers close.

Q. Will the differentiation systems go to the cloud?

A. Definitely, but they will move at a much more deliberate cadence. Many companies are starting with applications such as manufacturing intelligence rather than the execution system or product design collaboration rather than the actual CAD software.

There are also exceptions to this rule, however; we see some companies willing to move the full product suite to the cloud for these differentiation systems, sometimes to support regional operations in conjunction with global systems. These companies are paving the way for others to gain a comfort level with cloud-based deployment. In fact, we forecast that as security models and network reliability improve, concerns will diminish, and the cloud will be not only viable but also preferred.

Q. That sounds like a lot of different clouds. Is there an integration issue?

A. If companies are not careful, they can definitely find themselves snarled in a difficult situation in trying to integrate data and orchestrate processes. Despite the momentum and acceptance of cloud, the three types of systems are not moving at the same pace, nor do they share a common deployment approach. All of this explains the tremendous interest in hybrid cloud architectures and the importance of platforms.

The platform, sometimes referred to as platform as a service, provides a common foundation for data structures, application services, workflow, and analytic tools that can substantially ease the integration challenges. A successful platform offering will have a rich ecosystem of developers building on this common platform and provide manufacturers with plenty of choices without having to mix and match across diverse platforms.

Another key area is how the platform supports other increasingly important technology areas such as social business, mobile, and analytics. The combination of social, mobile, analytics, and cloud, which IDC refers to as the 3rd Platform, will represent 70% of all technology spending by manufacturers by 2020. In the 1st Platform era, companies defined themselves by the hardware they ran; they were Digital shops or IBM shops. During the 2nd Platform era, companies defined themselves by software, usually the ERP system; they were SAP shops

or Dynamics shops. In the 3rd Platform era, companies will associate themselves with the cloud platform; they will be Azure shops or one of the alternatives.

Q. **How does all the industry conversation about Internet of Things (IoT) fit in?**

A. Our cross-industry IoT research shows that manufacturing is leading adoption of and spending in IoT. IDC's 2015 *Vertical IT and Communications Survey* reveals that manufacturing segments such as automotive, consumer products, high-tech components, and chemicals are well above the average for IoT projects in pilot or in production. However, our manufacturing clients aren't calling us to inquire about IoT in and of itself, and IoT is nowhere near the top of the list of IT initiatives. Their interest begins with use cases that they understand are enabled by IoT — smart manufacturing, connected supply chain, and connected products.

Manufacturers are equally interested in each of these high-level categories of use cases, with some variation at the subsegment level. Initiatives on the factory floor go by many names — smart manufacturing, future factory, Industry 4.0 — but share the objective of being able to significantly improve throughput, quality, and asset utilization across the factory network. Supply chain modernization involves instrumenting the upstream and downstream processes to create near-real-time situational awareness that leads to higher customer service levels and lower costs. Perhaps the use case that receives the most attention is smart connected products. Manufacturers are interested in connecting to their products following deployment to create entirely new revenue opportunities based on service.

These use cases will also serve as a step to broader deployment of other advanced technologies such as 3D printing and advanced robotics. At the heart of each of these use cases is the need to react faster to customer requirements for increasingly tailored products. All of this activity points back to the importance of a cloud platform that will support the scope of these initiatives, the computing scale they will require, and the integration that will optimize the cost to operate.

Q. **There seems to be an overlap between operations technology and information technology, but these groups have historically been separate. Is this changing?**

A. This separation has been especially evident on the factory floor, and the short answer to the question is yes. Even when it comes to factory technology, it is no longer viable to work independently. Most manufacturing companies now consider their production facilities as instruments of customer differentiation rather than capacity that must be optimized.

Our data confirms the change that is under way. In a recent study on smart manufacturing, we found that while 42% of companies continue to run operations and information technology groups independently, the approach was declining. The most popular alternative to a segregated approach is a coordinated construct where the operations technology group and the information technology group agree on a common technology platform and use a program or project management office to control implementations. This approach now represents 47% of companies and continues to grow.

The remaining 11% of companies have moved even further. These companies have a fully integrated approach that uses a common organization to manage both execution and control technology. This tactic is also growing, and we see many companies heading in this direction.

Q.   **What guidance do you provide manufacturers?**

A.   First, cloud as a delivery option has matured to where it should be considered and often be given preference because the cost model is favorable. Second, be careful to evaluate companies that started on the cloud versus those that have transitioned to the cloud. The former often don't have as much functional coverage, while the latter may be handcuffed by their legacy code in terms of taking advantage of the cloud. You shouldn't have to sacrifice functionality or performance to realize the cost advantages.

Third, build a long-term plan around a viable cloud platform. We addressed the reasons in our responses to previous questions, but there will be substantial cost-of-ownership advantages. Look for a platform that can also provide a viable operations support option; essentially ERP. Also be sure that the provider has committed to advanced application management, integrating analytic tools, and building a vibrant set of partners that can support all of your application portfolio needs.

Perhaps the greatest advantage of the 3rd Platform (cloud) is speed. As manufacturers shift to more individualized products for discerning customers, they must be able to move fast. If they are going to match the cadence of modern markets, they must be able to react quickly, and a hybrid-based deployment approach for prospecting, operational, and differentiation systems delivers both the scale and the speed.

A B O U T T H E S E A N A L Y S T S

As group vice president, Robert Parker is responsible for the research direction for IDC Energy Insights, IDC Manufacturing Insights, and IDC Retail Insights, three of IDC's industry business units that provide global, fact-based research and analysis on best practices.

As a research vice president, Kimberly Knickle is responsible for research and analysis of business and IT issues for manufacturers. She leads the IT Priorities & Strategies program, which focuses on hot topics that are changing the way manufacturers buy and use IT, such as big data and analytics, cloud, IoT, mobility, social, and sustainability. The program also includes research based on IDC survey data related to manufacturers' IT investment priorities and plans.