Manufacturers have more data than ever, but leveraging it is a continuing struggle.
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S MANUFACTURING ORGANIZATIONS GAIN MORE CONTROL of the vast amounts of data involved in Manufacturing 4.0, data monetization is a growing priority. In fact, research suggests that manufacturers will invest nine times more on data monetization in 2023 than they did in 2016. However, companies are still struggling to become data driven. So how can they take full advantage of monetization opportunities?

Data-rich industries such as telecommunications and banking have been quick to grasp their opportunities to monetize. Using the volumes of data, they’re able to mold and target digital products and services to their consumers. It’s a much more significant change for manufacturers to move from a product-first to service-oriented business model.

However, more examples of manufacturers successfully monetizing their data are beginning to emerge. One of the most well-known of these is Rolls-Royce. While initially providing after-sales service and support for its aircraft engines, the company later outfitted those engines with sensors that allowed it to capture data and analyze it in real time, then provide customers with insights based on that data. In that way, Rolls-Royce can extend its relationship with the customer well beyond the initial engine sale or lease.

Defining Data Monetization

The best way to think about monetization is the ability to sell or add value internally to all the data available to an organization, rather than simply accumulating, storing and forgetting it or, worse still, not knowing it was ever there in the first place.

This definition expands beyond the packaging of new data-driven products and services to encompass any activity that creates added value for production and business operations. Going back to the example of Rolls-Royce, the company has also used the vast amounts of data from its engines to re-engineer its manufacturing processes to improve how the engines are designed, produced, and operated.

However, the definition should make clear that data monetization is built on a foundation of an organization that has control of its data and makes decisions based off of it. An organization must be able to capture, clean, integrate, and analyze its data to give the actionable insights needed to create real business value.

The Rise of Data Monetization in Manufacturing

There’s little doubt that Manufacturing 4.0 is reshaping operational and business environments. Industrial IoT is delivering new levels of connectivity. Vast troves of information are being created but they are still primarily used tactically rather than strategically. Digital technologies are being applied to optimize ongoing performance but only a few companies analyzing that data or blending it with data from other business systems to gain end-to-end visibility.

The companies that can get this right can open impressive opportunities to monetize their data in many different parts of their business. However, maximizing data remains a challenge.

Research and development: Today, designers and engineers have a wealth of information at their fingertips. For example, data from social media about a product can be combined with sales and marketing data to give insight on customer experience, usage patterns, possible design flaws, and product lifecycle. Service and support data help teams to design for both reliability and serviceability, leading to reduced breakdowns and faster maintenance. Procurement data enables companies to work with their suppliers to design components that can optimize production and reduce costs. Taken together, this data can deliver transformative insights, but the data is all too often siloed in CAD, ERP, PLM, or other manufacturing systems.

Operations and production: For almost any aspect of manufacturing, seamless and secure data flows between IT and OT is key for increased efficiency, quality, and agility. At a base level, IT/OT integration involves managing the interaction between ERP, PCS, MES, CMMS, SCADA and other systems. IIoT data has enabled the refinement of other technologies such as digital twins and AI/analytics, but these new data, applications and solutions must be brought together and integrated into the existing IT/OT ecosystem.

Service and support: Predictive maintenance is perhaps one of the best examples of where data from connected assets can help to ensure uptime but also be packaged as a service to offer ‘before it breaks’ maintenance that can reduce or replace planned maintenance. Field engineers also benefit by having access to service and repair information anytime, anywhere. However, that also requires that data from connected assets can be seen in the context of engineering and service documentation. Making this available to an engineer in an easily understandable format is no small challenge.

In all of those examples, data monetization is not a future prospect but something that manufacturers have the technology and capabilities to exploit today.

You Can’t Monetize What You Can’t Control

According to McKinsey, data-driven organizations are 23 times more likely to acquire new customers, six times more likely to retain them and 19 times more likely to be profitable as a result. However, a 2020 NewVantage Partners survey of 75 Fortune 1000 executive leaders found that less than 40% had created a data-driven organization. In fact, only half of companies were managing data as a business asset.

Because they are slow to build a data-first culture, companies are becoming far more...
The sad truth remains that before organizations can benefit from high-value activities such as data monetization, they must become much better at working with and managing data, from all the different data sources that face a modern manufacturer. These include internal data that belongs to the company itself — customer data, corporate data, connected asset and machine data, production and operations systems data — but also external data such as social media and news, weather and environmental data to monitor for disruptions, and updates for issues like government compliance regulations or legal requirements.

In this way, today’s market-disrupting technologies are a double-edged sword. They are pivotal to driving new and exciting opportunities to transform the way business operates and what it can achieve. However, they place a huge data burden on the organization that must be overcome.

**Industrial IoT: Only Part of Manufacturing 4.0**

Industrial IoT is a fundamental pillar of the digital transformation that underpins Manufacturing 4.0. However, it may be too easy to focus on the role of Industrial IoT by itself. Instead, Industrial IoT adds the connected devices and smart assets that go to create a new type of digital ecosystem of people, systems and things.

In 2016, Harvard Business School wrote: “IoT is at the peak of Gartner’s 2015 hype cycle, which suggests the next phase will be disillusionment, and it will be years before we see real productivity gains.”

That prediction has proved to be quite prophetic. Since then, research has shown that 76% of all IoT initiatives fail to meet expectations, with as many as one in three never making it off the drawing board.

**Application Proliferation and Information Sprawl**

The potential to monetize ever-increasing data may well distinguish the winners from the losers as the transition to Manufacturing 4.0 accelerates.
Computing has become more complex for every manufacturer: More applications and data than ever before, as well as a mix of legacy and digital systems, are running over what is often an aging infrastructure.

It’s often said that data is the new oil but if it’s to flow like that it needs to pass through the network quickly and effectively. Yet, traditional approaches to data integration are struggling in the era of big data. IDG found that almost half of all integration projects fail with sometimes damaging results. Forrester reports that 93% of firms believe the operational and technical challenges with their integration strategies result in serious business repercussions like revenue loss, losing customers to competitors, and difficulty optimizing processes.

Data integration has often been treated as a point-to-point translation of data between the source and target application. As data and applications grow, this approach lacks both scalability and agility. In addition, inflexible legacy IT infrastructures impede data integration efforts. In response, organizations are deploying a wide range of data integration tools and solutions, with nearly one in five organizations reporting the use of 10 or more, according to IDG. To meet the goals of digital transformation, such as data monetization, information integration should be placed at the center of enterprise computing (see figure 2). A central platform or digital backbone that provides unified integration across complex and dispersed digital ecosystems of people, applications and things, delivering:

- Complete assurance the correct data is available when and where it’s needed
- Digital communications with 100% of your trading community
- Optimized and automated business processes
- Data consistency and accuracy across enterprise applications
- Increased collaboration and innovation across the business and supply chain
- Near real-time visibility into your business processes and trading partner relationships

Forrester recommended this type of strategic digital integration platform as the best way to overcome integration complexity in today’s business.

The firm said: “This platform is a comprehensive end-to-end approach that converges data integration and data management, application integration, B2B integration, and IoT integration into a coherent set of capabilities and reduces the burden of managing an increasing number of connections.

### Comprehensive Integration Capabilities

A cloud integration platform integration platform connects applications, systems, and things to move data between various endpoints according to the specified integration patterns and security standards. The platform enables any-to-any data integrations to ensure that data can be quickly mapped and translated between all systems whether in the cloud, on premises, or legacy. The platform facilitates connectivity and information exchange between the organization, its suppliers, partners, and customers. A new generation of enterprise integration platform is emerging that provides advanced features to extend the speed and power of integrations. These include the use of a modern microservices architecture and comprehensive API to support high scalability, flexibility, and resilience. In addition, some offer self-service functionality to allow users to complete simple integration tasks, ensuring they can specify and access the data they need.

### Data integration: The Essential Step

The potential to monetize the ever-increasing data that a manufacturer creates is too great to ignore. Indeed, it may well distinguish the winners from the losers as the transition to Manufacturing 4.0 accelerates. Achieving this goal only happens when you can add intelligence to your data-leveraging AI and analytics to gain insight to make informed decisions.

The role of the enterprise integration becomes fundamental. Forrester concluded this type of strategic platform is “foundational to the type of digital transformation that prepares a firm to react to an unpredictable future of digital disruption and to get maximum value from its data.”

There’s an essential step between data and insight and that’s integration. Only when information passes smoothly across your business and with your customers and suppliers are you able to fully optimize your data.