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HOW MANUFACTURING EQUIPMENT OEMS DISCOVER THE ROLE OF IoT IN PRODUCT INNOVATION

LOSANT WHITEPAPER

INTRODUCTION

The concept behind the Internet of Things (IoT) is simple: real-time data greatly accelerates the ability to learn and innovate, ultimately improving how we perform in business and how customers experience our products. Putting it — IoT – to work, though, is not something anyone would call simple, perhaps least of all the heavy-industry sector, including manufacturing equipment OEMs. Many questions remain about how to get started. Exploring IoT involves investment in change, disruption of proven models, new ways of operating, serving customers better, and increasing revenue in unexpected ways. The work of linking to organizational strategy, envisioning, proving and implementing the IoT opportunity for one's own industry and company awaits the great majority.

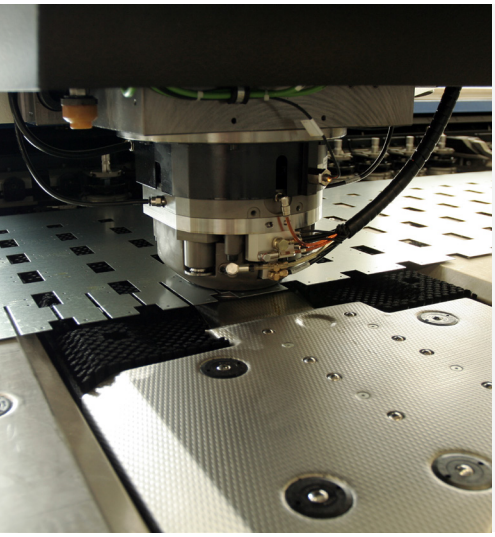
BACKGROUND

Manufacturing OEMs — the designers and builders of capital equipment for manufacturing — are the originators of machine productivity that fuels our industrialized economy. An entire world of commercial and consumer products, related services and consumption exists downstream from their efforts. The OEM mindset, therefore, is weighty: innovative yet skeptical, relentlessly safety conscious, quality-and value-driven, global, sustainable, long-term, results-based. Meanwhile, intensifying global competition, commoditization of hardware, and growing interest among customers for digital services are challenging the industry to innovate as never before. No longer will large capital investment and long product lifecycles provide assurances of customer loyalty and limits to the pace of change as they once did.

OEMs hold a foundational position, and an increasingly pivotal role, as digital connectivity accelerates across nearly every industry. When the sheer velocity of advancement becomes the overarching challenge of doing business, an even deeper challenge is brought to bear — the need to lead, not follow. The industrial equipment OEM is challenged to do more than be swept along, attentively yet patiently, with the rising tides of technology. "The future will have its way with our industry no matter what I do," one might believe. "I'll meet you up ahead when the hoopla is over and the bugs are worked out. Then we'll jump in." Except, "then" will be at least a generation behind and losing ground. Advantage, position, share and yet unimaginable new opportunity are gained when the approaching future is embraced, internalized and made part of the work being done every day. How to start and what to work on are indeed key questions. This article provides in-depth perspective from IoT platform leaders, tailored for manufacturing equipment OEMs, on the state of this rapidly emerging technology, the impact it is having and the keys to participation.

UNDERSTANDING THE BENEFITS AND THE MINDSET

The Internet of Things is a world of continuous learning from everyday objects and their operation. Machines, individual components and processes serve as data inputs forming a powerful nerve center of visibility, measurement and optimization. The IoT platform provides data for ongoing improvement of products, such as manufacturing equipment, never before achievable. Enhanced understanding and command of process outcomes enable new forms of value creation, new services and business models. To illustrate, here is a typical scenario:



A common industrial stamping machine (or dozens, or hundreds…) is outfitted with sensors that monitor and record temperatures, pressure, speed, abrasion, vibration and more, continuously, forming a database of operational insights. An IoT data platform displays this information in real time, intuitively arranged and mathematically supported. Checkpoints and alerts can be set, and actions initiated. Over time, observers learn to identify conditions that signal the need for service, parts replacement or maintenance within two hours…two shifts…two months. This is an example of IoT-driven condition based maintenance. Today, it is replacing the familiar notion of preventive maintenance as more immediate, actionable data inform operators of precisely when service will be needed.

CONSIDER THE BENEFITS

The OEM and its customer move from a reactive to a proactive maintenance model. With the application of operational history and AI, reliable predictive maintenance guidelines can be developed. Operating efficiency is enhanced by real-time data feeding established monitoring and reporting needs. Customer experience is elevated through monitoring, controlling and managing assets. New business models and revenue streams can emerge as entirely new new data-driven, packaged or fee-based services. New revenue capability examples:

To the manufacturer/customer:

- *Enhanced data-driven product options at higher price-points*
- *Improved user experience enables greater margin*
- *Enhanced maintenance agreements leveraging condition-based advantages*
- *Selling/pricing for value beyond quality/dependability to process optimization*

Enabling the manufacturer/customer to deliver new, valuable benefits to its customer:

- *Enhanced quality assurances to end customer via data collection and reporting*
- *Improved ability to meet timing and order requirements cost efficiently*
- *Delivering enhanced customer experience via digital data availability and support*

APPRECIATE THE MINDSET

Equipment OEMs, manufacturers, and the end users they serve all enjoy the better experience and business opportunity of products enhanced with digital services. Remarkably, the data that is so integral to our equipment and processes has always been there, yet locked away, unable to be collected, quantified, understood and utilized in real-time. Industrial producers and equipment operators have been satisfied with a mindset of gauging specific conditions and measuring performance retrospectively, after the fact — navigating from the rear view mirror — rather than measuring and connecting a variety of key data points while in operation. IoT implementation changes all of that. It then allows the ability to discover downstream uses and value from these new insights that open up new services and business models. This shift of perspective and the technology supporting it are the essence of IoT.

To offer an analogy, consider: before there was commercial air transportation, travel always existed. Yet traveling a long distance was slow, costly and uncomfortable. Flight changed the givens. The development of rapid, affordable, comfortable mobility turned what was a problem (distance) into a solution — speed, mobility and location as advantage. Similarly, IoT advances us through rapid, affordable, reliable command of data, links it and delivers it in ways that can improve what a business does and how it measures success. This is the kind of change that is underway. It is transformative and of increasing importance to capital equipment manufacturers seeking better command of their future. To participate, there is a need to understand the benefits, adopt the mindset and answer the question, "What can IoT can do for us, our organization and customers?" Next, let's consider several key issues, considerations and productive steps forward.

REACHING A SHARED IoT VIEWPOINT

For manufacturers of industrial equipment and many others, IoT has transitioned from a kind of news flash to a growing drumbeat, leading OEMs toward an unknown yet inevitably connected, data-enhanced future. No longer is IoT a concept to be marveled, but a future to embark upon. This realization has occurred quickly, faster than is comfortable, but especially so for the heavy manufacturing sector. Before an OEM is prepared to take a direction on IoT opportunity, there should be alignment with business and organizational purpose, global footprint, talent, customers and innovation strategies. Buy-in and commitment from leadership is necessary. Then a strategic idea that everyone can believe in and support becomes possible to identify. Part of the challenge is that IoT means different things to different OEM decision makers. It is typical for companies to house a variety of opinions and viewpoints across key functions regarding IoT's promise or the best route to participation. Leadership teams and board members realizing the deep commitment and change IoT requires may favor patience and additional learning over consensus and decision-making, development, and innovation. Marketing executives, citing opportunities in category leadership, customer experience and the share gains IoT could bring about may want to accelerate adoption of an IoT strategy.

While there are challenges to getting started, the reality is that not all companies are equally prepared for the first step and the journey to follow. McKinsey & Company cites maturity along two key axes —Technological and Strategic/ Organizational —as key indicators in the categorization of companies as either: "Leaders, Stuck Players, Interested Players, or Avoiders," from an IoT readiness perspective. [1] Digital/McKinsey, Leveraging industrial software stack advancement for digital transformation. Exhibit 14. [Graphic]

With these factors in mind, the need for objective, detailed, strategic discussion leading to consensus on the IoT topic is clear. McKinsey observes:

> ***"Due to the importance of IoT platforms to the industrial equipment and machinery sector, industry players should sooner rather than later develop a clear perspective for their organizations. This perspective needs to identify several essential topics, including the related value at stake for revenue and profit, the expected time frame of the development of the market, technical enablers that should be put in place, the optimal level of investment in technologies and services, and the capabilities and partnerships to be built to support success."*** [2]
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> **MCKINSEY & COMPANY, 2018**

PURSUING AN IoT USE CONCEPT BASED IN CUSTOMER BENEFIT

The promise of transformative potential via IoT is tempered by the most fundamental reality of business — will it matter to customers? It is important for OEMs to ask:

- *Does the IoT application we envision solve an actual problem or deliver a real advantage that can help us create and retain manufacturer customers (B2B perspective) or by helping our manufacturers do the same relative to their customer (B2B2B or B2B2C perspective)?*
- *Does our IoT focus contribute to our stated strategy?*
- *Will it differentiate us?*

All of the questions of business remain relevant, yet now from an IoT new possibilities vantage point. Seeing the IoT platform and its many exciting capabilities as a tool serving business relationships first, rather than somehow being separated from or beyond this goal, is a valuable basis from which to discover what IoT can truly bring to the organization.

For this reason, innovation and product development experts within OEMs command a critical, up-close vantage point and a central role in helping to envision and influence the aim of the IoT initiative. First-hand knowledge of products, competition and broader marketplace factors help inform, evaluate, prioritize and fine-tune what is hoped or can be achieved with an IoT concept and the right platform solution.

With these considerations in mind, areas of IoT application which have proved most beneficial to the manufacturing equipment sector at various levels include the following:

PROCESS OPTIMIZATION

Continuous monitoring, data collection and learning enabling incremental refinements to process variables such as physical set-up, speed, sequence, operating protocols and more for the equipment or external factors.

REMOTE MONITORING & MAINTENANCE

Uninterrupted tracking, oversight and security of capital assets via data monitored centrally or via mobile, showing location, operating status, environmental conditions, maintenance related issues and more.

CONDITION-BASED MAINTENANCE

Data providing critical measures of operating conditions, from which maintenance can be initiated or scheduled with optimal precision to preempt equipment going out-of-service and avoiding the significant cost of downtime.

The idea is the first step to IoT utilization. Assistance from an IoT platform provider can help ensure productivity and success at this intangible and often elusive stage of the process. Specialized IoT knowledge and insights help to guide the application/use idea process, interpret and organize the system/process design and assist the company with objective evaluation of a concept and its likelihood of provability.

PROVING THE IoT CONCEPT

As with any new product or product feature, IoT application requires testing on a limited basis before widespread adoption and rollout. A specific use case is identified, described and executed using IoT edge hardware (sensors) and a data platform that delivers the information output. The proof-of-concept step (POC) is necessary due-diligence and requires fully functional application of an IoT solution focused on a specific desired use and outcome. An IoT platform provider can simplify and streamline concept proving and evaluation on a project basis. Such an initial engagement can be a valuable testing ground that leads to a beneficial ongoing working relationship with an IoT platform expert.

IoT PLATFORM PROVIDER RELATIONSHIP

Implementation of an IoT solution is generally not within the scope or capacity of internal IT departments and the demands are highly specialized. Experienced IoT platform providers already have the keys and a head start on the dashboard needed to support basic objectives, and this can save valuable time while ensuring momentum toward specific goals. The exact choice of provider however is critical. Integration of an IoT initiative with the organization's existing management software and information protocols requires that an IoT platform provider be carefully evaluated before selection.

Certain best practice measures, or operating standards to look for include:

- *Standardized integration opportunities (ERP, MES, PLM, CRM, etc.)*
- *IoT provider does not approach end customers (vendor neutrality)*
- *Platform provider uses open standards*
- *Ability to use the platform or part of the platform on edge*
- *Ability to use all or parts of the platform in the cloud*

CONCLUSION

The potential of IoT should not be overlooked or placed on a shelf for someday. There is much progress already to ride forward upon successfully. Finding and proving the focus of IoT application is the necessary next step for most. Innovation and advancement in their many forms have always relied upon pioneers. In the case of the Internet of Things, the way makers are the expert organizations that have made it their business to fulfill what was once only imaginable digital connectivity of objects and operations by making it a proven and promising reality. The best IoT platform providers exist, first, to serve their clients pursuits, while continuing to advance the science and practicality of IoT and the life enhancing potential of data connectedness. We hope our perspectives have been helpful.

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ABOUT LOSANT

Losant is an easy-to-use and powerful enterprise IoT platform designed to help teams quickly and securely build complex real-time connected solutions. Losant uses open communication standards to provide connectivity from one to millions of devices and provides powerful data collection, aggregation, and visualization features to empower enterprise teams with new data insights. Edge features are integrated directly into the Losant IoT platform for seamless integration of connected and non-connected devices.