Smart industry

SPECIAL REPORT

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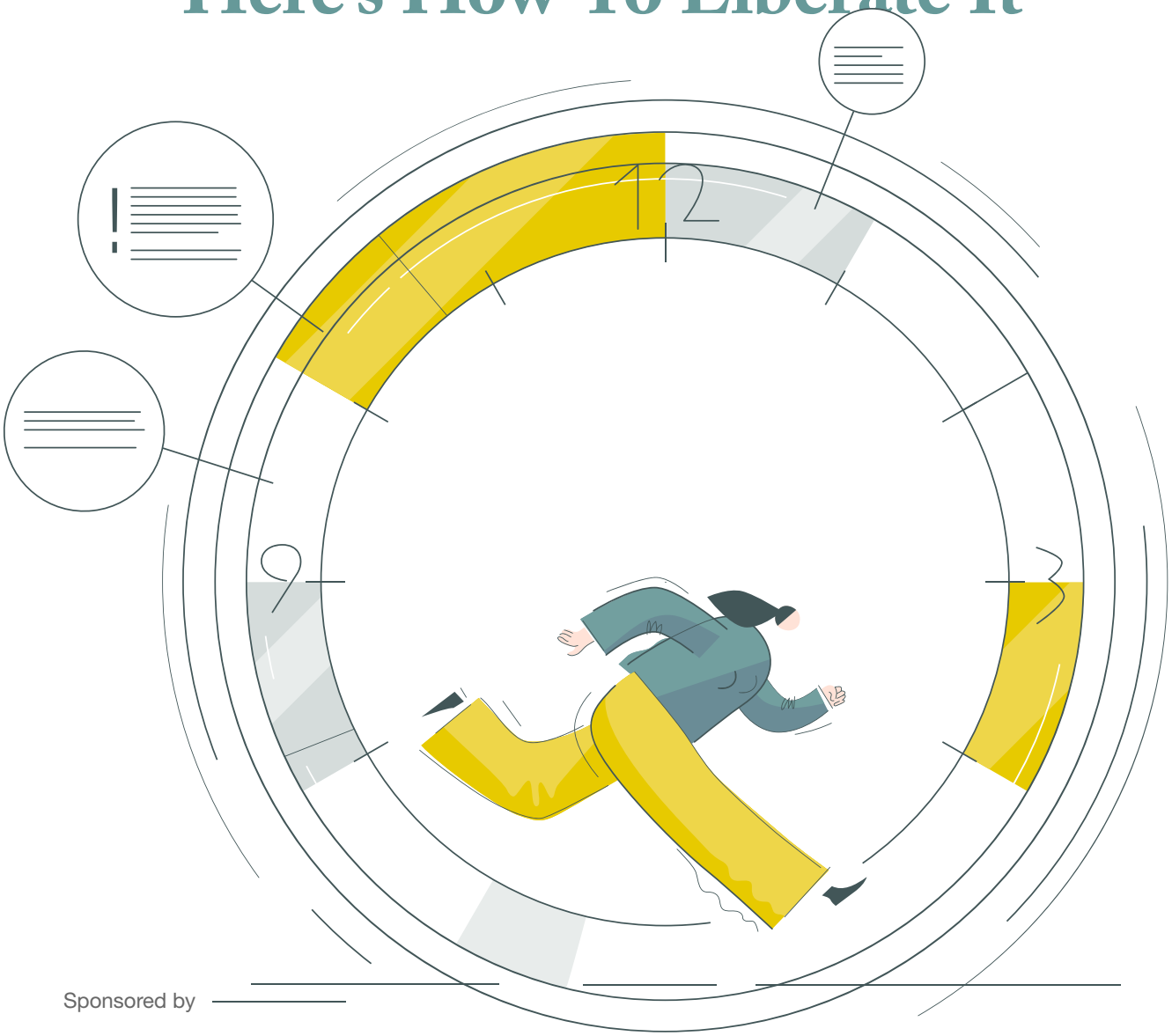
Your Industrial Data Is Trapped...

Here's How To Liberate It



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Plants run smarter on Fusion

Data drives decisions on plant operations. But if teams company-wide can't access the data, decision-making is compromised. Uptake Fusion solves the data dilemma. Fusion extracts the data from on-site historians and stores it in the cloud, where it's available for advanced analytics that help plants run smarter.

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Your Data Deserves To Be Liberated

By Chris McNamara, Smart Industry editor in chief

We're working in an era when industrial data has never been more prevalent or more important.

Properly using asset data is, quite literally, a deciding factor in whether an enterprise can stay competitive. And while we're all aware of the criticality of our data, we still struggle with unlocking it and translating it into a usable format—liberating the data, if you will—to empower full digital transformation and optimal performance.

Your data deserves to be liberated. Your enterprise deserves every advantage it can get. Your stakeholders deserve the visibility into their operations that is capable with modern data-analytics tools and techniques.

This Special Report can help you get what you deserve.

Liberating Data & Gaining Newfound Visibility Of Opportunities: A Q&A With Uptake Experts

Liberating OT data is critical to success in the modern manufacturing landscape. We get that. Liberating OT data into a useful, accessible format can be tricky in the modern manufacturing landscape. We get that, too.

But there are guides.

Here we dive into the topic with Uptake's Dr. Dave Shook, chief data officer, and Andrew Soignier, vice president of global sales, to explore the ease with which we can now move, store and access OT data in the cloud, the security pain points that must be addressed, and the visibility into business that this liberated-data environment enables.

Smart Industry: What does it mean to liberate data?

Dave: Let's talk first about how data is trapped. In the industrial world there several layers of protection between the industrial-controls systems and the business network; those layers are in place so that when an unauthorized person comes in with ransomware, a virus, or is sleuthing, there is a much lower risk to the computer systems and operating facilities.

There are layers of firewalls—multiple sets of authentication rules. There is a technical set of barriers between the operational sets of data and the busines levels.

Automation software is written to work in these complex environments, and often data is set up in a way that it is great for operations and operational troubleshooting, but it is not available for enterprises-wide analytics. So, if you want to do analysis of problems in today's manufacturing plants, if you want to do an enterprise-wide reliability study across multiple facilities, that data might be trapped several layers deep. And that data is typically constrained in how you can access it.

These legacy systems are not set up for big data. Liberating data means extracting it—with security being the highest priority—from these protective barriers and any limits on the amount of data that can be accessed at one time. When we liberate data, we get it out from these closed industrial environments and into the business' secure cloud spaces, where

authorized people and applications can study and act upon all of the data at once.

Smart Industry: Complexity is an obstacle. How does the size of an enterprise factor into this discussion?

Liberating data means extracting it from barriers and any limits on the amount of data that can be accesssed at one time.

Andrew: It's not exactly linear. We see large super-major organizations with small network layers, and conversely, smaller operations with large networks. It really depends on network topology, safety topology, cybersecurity, etc. Different businesses are set up to assume a level of risk that they are willing to accept in conjunction with regulatory components.

Smart Industry: How does regulation affect getting data into actionable forms?

Dave: There have been industrial best practices in place for 15 years, commonly referred to as the Purdue Security Model. There are also organizations like the International Society for Automation (ISA) that come up with recommended practices that are widely adopted by the manufacturing industry. But whether your corporation is highly regulated or not, it's just good practice to install these layers of network segregation.

Smart Industry: Does that network segregation complicate data access?

Dave: It can, yes. It's one thing to connect from your home PC to your bank, for example—you're going through your firewall and connecting to the bank (one firewall). It's something else entirely to go through two successive firewalls and use the same hole through those firewalls; good security practice doesn't allow this. Since you're traversing though multiple firewalls you need to find a way to land the data between them and change the communication protocol or the security keys so that no one who can penetrate the first firewall can penetrate the second.

With industrial-data access, these systems are explicitly designed to be secure by default. They are explicitly designed to permit local access to the data, so if you want to transport that data to your cloud you need to know what you're doing. It requires skill and experience to solve the problem in responsible, cyber-secure way.

Smart Industry: So let's explore that topic of solving this problem… securely accessing and transferring industrial OT data to the cloud.

Andrew: Traditionally, leaders that are responsible to deliver these solutions don't have all the knowledge required or aren't the owner of the data's origin. This becomes exponentially complex when stakeholders across an organization have different responsibilities and knowledge related to data. OT data is basically ingrained in the DNA of the business. Part of the dilemma of getting the data from OT to IT is as much the technology as it is the understanding among the people. The patterns may look the same but they're not the same.

Getting data from OT to IT is as much technology as it is the understanding among people.

Smart Industry: So what's the fix? Do we have to change technologies or mindsets or personnel?

Andrew: It's all three. Increasingly we see the convergence of OT and IT, and companies need technology that bridges the gap between those two. Uptake has designed its technology to put it in the terms that bring together the people of OT and IT communities, regardless of the line of demarcation (which is changing, by the way) in

their responsibilities around the data. We develop techniques and methodologies that bring people together, regardless of their organizational dividing lines.

Smart Industry: Is that dividing line between IT and OT shrinking? Are OT teams recognizing the need to be more cognizant of IT motivations and is IT communicating better with OT?

Dave: To an extent. There is a big difference in priorities—IT is predominantly concerned with security and protocol to keep the business secure and protected; OT's first job is to keep the plant running efficiently. So, when you consider that IT's motivations are driven by confidentiality trumping the availability of data, yet OT is advocating for data availability over confidentiality, you can see how conflict can arise. Both sides think the other side doesn't understand what *busines critical* means.

More and more, I'm seeing both sides learn that you need IT security expertise in the OT environment below the firewall. That part of convergence is happening.

There is still work to be done and opportunities for IT departments to have a deeper understanding about the data coming out of operations and the value in that data. The other side of that coin is that OT can learn from IT regarding security. The reality is that they need each other and the data, and if they can start to talk the same language and collaborate, they will unlock potential around reliability, sustainability, profitability and more.

Andrew: If you look at this landscape from a macro perspective—which industrial organizations have led digital transformations? The answer: the businesses with CIOs and CDOs who are degreed engineers. It's these types of leaders that truly understand the relationship between the OT and IT worlds, hence they succeed often. If the caption of the IT ship doesn't understand the business and engineering problems involved, they can't be first movers.

Smart Industry: What is enabled by keeping data accessible to all parties at the right time, at the right place?

Andrew: Access to data is key. Data is not hard to get, but it is hard to get business leaders to understand data access needs and to then change behaviors to ensure data is not siloed and trapped. Understanding and enabling access must happen to create an ecosystem of data, versus silos.

Dave: Let me provide an example. There was a large enterprise that had multiple information systems that were needed to run the operations. We tend to think of the operational system as being the control system, but there are other parts, like production-scheduling software, that are as much a part of the operations as the control system. So those systems—although not necessary to be buried a couple firewalls deep—are

It is now actually appropriate for companies to extend their control system DMZ up to the cloud.

secured and have owners who are understandably concerned about people hitting their server too hard.

What results is system owners who are not going to give everybody access, and that just doesn't cut it in the modern environment. If you cannot get the data out of those isolated locations to analyze it with other data, it doesn't work. There are many, many instanced of these little islands of operational data that are fiercely protected by the people who need them to do their jobs and turn the crank to generate money.

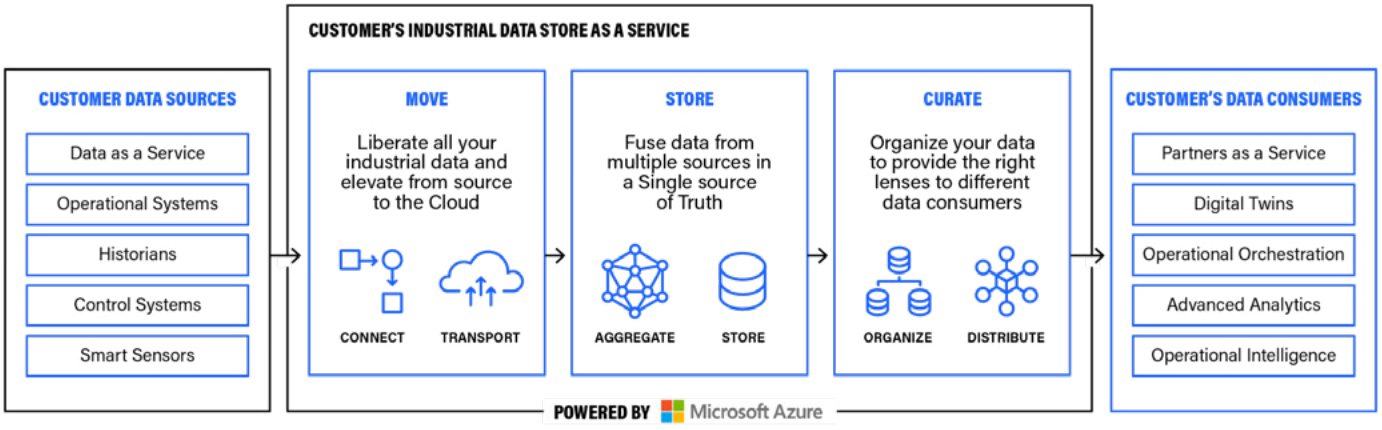
Smart Industry: How does the management of data in an ecosystem (rather than silos) change approaches to that process?

Andrew: Teams will talk about OT or time-series data ownership, but it is not that simple today. The owner of it is not IT nor OT; It's a challenge that everybody is trying to work through. We at Uptake are providing technology and methodology to bridge the gap. It's not about "team A" or "team B" owning data, it's about the bonded pair owning it together.

Dave: It's about agility to local market and better cost. In manufacturing in general, the plant or the site is a meaningful organizational construct. It's not an arbitrary department. Inside the walls or fence line of a site, everything is there for a reason. In order to respond to difficult market conditions, that site needs to respond as a cohesive entity. During good times, companies tend look at cross-organizational optimizations. During tough times companies focus on how they can drive down costs and improve responsiveness. You need a P&L and someone watching it who goes "My contractor expenses are out of control… what's going on?" Someone has to come down with hammer and say, "We have to increase production."

Smart Industry: So we've explored the challenges. What is encouraging about liberating OT data properly?

Dave: The acquisition of operational data to the cloud is, quite frankly, a solved problem. It is possible to securely, reliably, robustly (and with manageable total cost of ownership) get operations data to the cloud in way that respects all of the IT people's concerns. We've been helped along in recent years by companies like Microsoft when it comes to security management. It is now actually appropriate for companies to extend their control system DMZ up to the cloud. You can extend the OT region up to Microsoft Azure in as a secure a manner as if it were on premises. The transfer of data to an open



environment is now a solved problem. And we're able to make that happen.

The reason you get the data up to cloud is because once data is in an open environment you can find opportunities to save money, improve production, and boost reliability. Those opportunities are much easier to find by having data from multiple systems organized in one place and accessible to different people looking at it with their own curated view.

Drew: Most of the asset-intensive market is simple: they want to maintain their license to operate in the current economic world while making money and maintaining a competitive advantage. If you don't have OT data at your disposal, you can't identify the needles in the haystacks. This data enables you to optimize assets and Uptake has developed a product to do that.

Dave: If you want to get ahead you have to use your assets as intelligently as you can. You must change how you use your assets, and that requires making data accessible and open.

This enables an enormous number of opportunities. Many times, when data locked away, you don't know what you don't know. By freeing data you can start to understand the complexities of running your organization. Once you get your data out in your cloud, you have enterprise-wide tools that enable you to scale and speed up.

CASE STUDY

Major energy company uses Fusion for data access and Time Series Insights

Uptake Fusion helped a multinational energy company liberate its operational data from 40+ global sites. Centralized data in the cloud is optimized for Time Series Insights, Power BI, and Uptake AI products and services.

BACKGROUND

One of the world's leading integrated energy companies is engaged in every aspect of oil, natural gas, fuels, lubricants, renewable energy, as well as hydrocarbon exploration and production. Business units also produce petrochemicals used in industrial manufacturing. The company operates in more than 180 countries and ranks in the top 20 of the Fortune 500.

CHALLENGES

The energy company was experiencing several challenges in accelerating its digital transformation program. Chief among these was extracting data of any type from data historian applications like OSIsoft PI. Data drives decisions, but lack of data goes nowhere. Other significant challenges included egressing metadata models from current systems like PI-AF, encountering low latency for streaming data, and overcoming the common hurdles associated with transporting tags.

Advancing toward digital transformation demanded exploiting opportunities to scale, reuse, and share innovations across the company's global footprint. Key systems required integration for a digital twin to incorporate operational data. All application, machine learning, and reporting development must be in alignment with best practices.

SOLUTIONS

Uptake Fusion fundamentally changed how the company accesses and leverages its operational data. Fusion connectors automatically ferry data in real-time from more than 20 sites globally to a cloud-based historian. Uptake Lenses organizes the data and makes it accessible for different audiences. As a result, the company can

fast-track and share innovations, as well as leverage digital twins and applications like machine learning.

APPLICATIONS

Digital transformation was the goal, but the timetable needed to be accelerated, especially with operational data across various regions. Uptake had the answer with Uptake Fusion.

Uptake's components that were implemented include:

- **Connector**: Provides data connectivity to different endpoints for historical, instantaneous, and metadata
- **Elevate™**: Extracts data from on-premise operational systems andmoves it to the cloud
- **Lenses™**: Organizes data for use by different stakeholders. Provide access in an open format for visualization analytics, orchestration, and reporting data ocnsumers.

Fusion connectors for data connectivity connected via open APIs and open data formats. Fusion liberated the company's industrial data while Elevate enabled source data's transfer to the cloud. Once in the cloud, Uptake Lenses organized and correlated the data for different stakeholders like company groups or other applications.

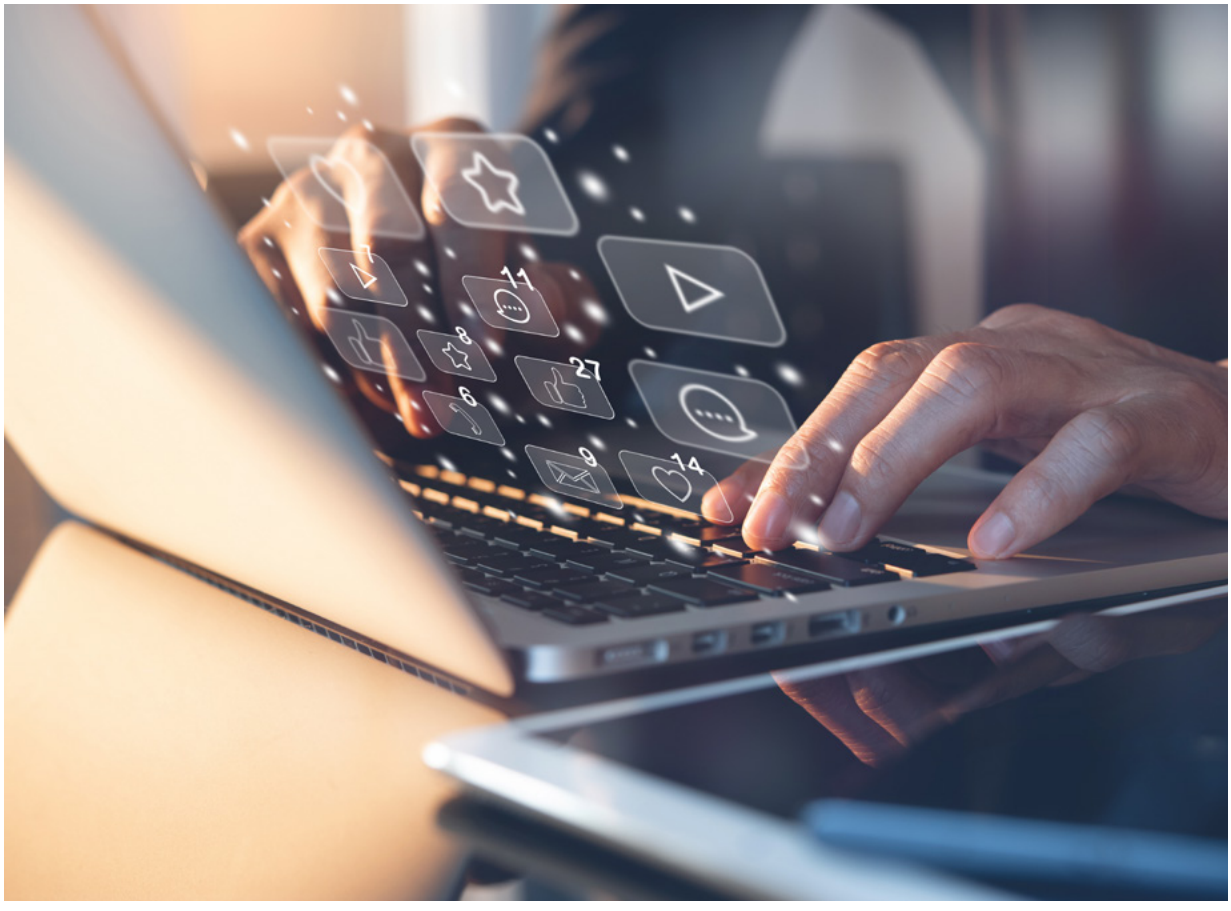
RESULTS

Egressing PI and PI-AF data from over 20 sites worldwide and moving the data to a central Uptake Fusion with Azure Time Series Insights deployment have equipped the company to make an impact across multiple areas and enterprise-wide, including:

- Optimization and Fleet Benchmarking
- Stream Costs and Soft Sensors
- Failure Prediction and Root Cause Analysis □

Uptake is an exemplary and critical partner. Their team is working with us to drive innovation and scalability to accelerate us to our goals in commoditizing surface time-series data for enterprise reuse by making it universally available, accessible, and useful.

Process Control Systems Engineer
Major Energy Company



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