Closing the Industrial Analytics Data Gap At Scale

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Most manufacturers have multiple systems with each system storing data in its own database. To leverage this data, manufacturers are building application solutions that connect to one single system and limited data sources, therefore offer limited usage of the data. This siloed approach over time becomes more isolated, complicated, and difficult to support. Manufacturers are looking for solutions that can help them close this data gap and accelerate their digital transformation journey.

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Executive Overview

Modern data hubs can synchronize processes and systems, leading to greater flexibility, resiliency, and efficiency. The ability to store and manage data quickly from multiple sources across multiple platforms and plants is an integral part of the digital trans-formation, which can be realized using modern data hubs.

Manufacturers are embarking digital transformation and Industry 4.0 initiatives. Most manufacturers have multiple systems with each system storing data in its own database. To leverage this data, manufacturers are building band-aid application solutions that offers limited usage of this data. Custom script data flows addressed a single, short term use case problem of moving operational data to the cloud. This siloed approach over time becomes more isolated, complicated, and difficult to support. A SaaS based data hub, such as Uptake Fusion can be a cost effective, efficient, and scalable solution for manufacturers trying to consolidate data silos and accelerate their digital transformation.

Manufacturing Data Challenges

Although more manufacturers are trying to standardize on technologies, most manufacturers have complex technology stacks – from PLCs to DCS to MES and ERP, custom machines, supply chain, systems as well as multiple cloud, edge, and data lakes and all on different versions or from different suppliers – and this can be an inhibitor for the digital transformation. Many manufacturers have legacy and custom homegrown/custom systems, machines, spreadsheets and other data sources in data silos. As operations technology data is highly sensitive, it is also kept separate from information technology systems.

As a result, the ability to collaborate, scale, contextualize data from all these data sources and obtain accurate end-to-end manufacturing intelligence continues to challenge many manufacturers. Maintaining and updating all these technologies is also challenging, and even more so today, with data storage in the cloud, edge and on-premise. Rip and replacement of these older systems and applications is often too costly and time consuming, making it difficult for some manufacturers to modernize and adopt digital transformation technologies. Even today, many organizations continue to operate with dark data – some stored in excel, spreadsheets.

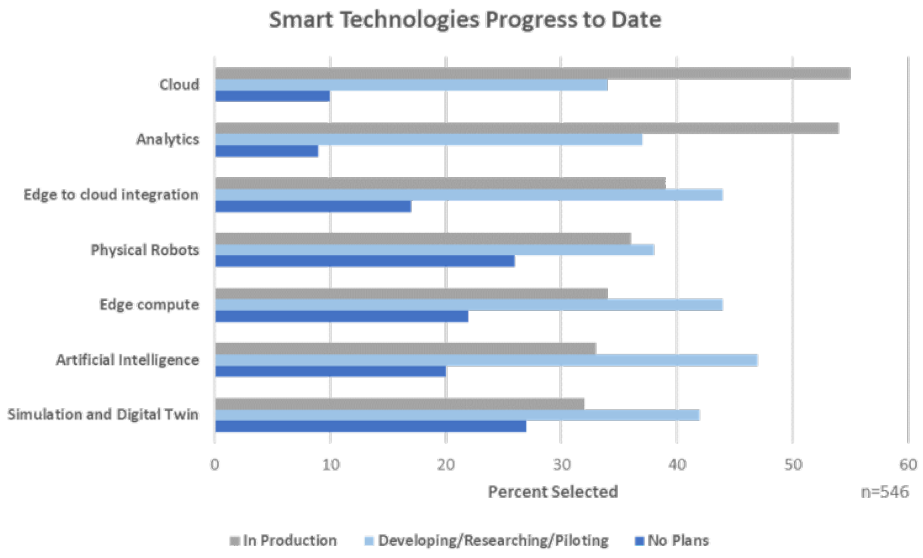
The many mega mergers, acquisitions, and partnerships in the industrial world presents each industrial manufacturing company with different sys-

tems, machines, custom applications, dark data silos, and shadow user IT. This often tends to inhibit collaboration within and amongst users in the plant, site, and across the enterprise. Shadow IT can be costly, difficult to maintain and inhibit standards and innovation across the enterprise. The lack of collaboration tends to inhibit data intelligence and insights, causing missed opportunities.

Historically, connecting siloed industrial data can be time consuming, and by the time the information is integrated with the other information in the plant, the intelligence gained may already be too late to make a difference in the process, product quality, material sourcing, product demand, and more. This limits the manufacturers' ability to remain competitive. Having multiple data sources, multiple views, and multiple data management technologies can inhibit a manufacturer's efficiency. It also inhibits the company's ability to take advantage of the digital transformation and Industry 4.0 technologies and the subsequent benefits offered.

Closing the Data Gap with Data Hubs

Modern data hubs can synchronize processes and systems, leading to greater flexibility, resiliency, and efficiency. The ability to store and manage data quickly from multiple sources across multiple platforms and plants is an integral part of the digital transformation, which can be realized using modern data hubs. Cloud native data hub solutions further increase the value proposition for manufacturers.



Source: ARC Digital Transformation Survey, December 2022

Organizations are already leveraging cloud technology. Large portions of IT and enterprise software are already in the cloud or transitioning to that environment.

Overall, the value of cloud solutions is becoming widely accepted. Adoption of analytics solutions also continue to grow in the industry, as the technology will be the key to turning industrial data into valuable insights.

Recent ARC digital transformation survey highlighted the growing acceptance of cloud and analytics technology, where half of the survey participants were already leveraging the technology, and over a quarter were in the process of implementation. However, organizations are realizing that majority of their data is not analytics ready. They are spending a lot of time and resources extracting the data, cleaning the data, and then building custom single application analytics solutions, that only addresses limited use cases. This approach limit data usage across the enterprise and is challenging to maintain because it is built on legacy technologies, such as historian, point to point integration, data warehouse, each with its own that has limitations.

Technology Approach	Limitation
Historian	Tag dependency, and integration of multiple historians is difficult to manage
Point to point data integration	Combining data models and managing multiple systems is challenging without data disruption
Data lakes/data warehouse	Difficult to get raw, normalized industrial data into the data lake using IT data centric ingestion methods
SaaS analytics solutions	Managing OT/IoT data context is challenging with analytics solutions alone

Different Technology Approaches to Address Industrial Data Gap and its limitations

Unified Data with Uptake Fusion

Uptake Fusion is a leading industrial data hub solution that leverages cloud technology to offer quick central access to industrial operations technology and IoT data with context for advanced analytics use cases. The cloud native SaaS solution, Uptake Fusion collects data from multiple databases, industrial systems, IoT sensors, and process instruments. The solution extract additional information from multiple systems such as metadata, hierarchical data and combine all this data into a single repository/data hub. It performs gap detection, normalize and preprocess the data and make it analytics ready. This contextualized data can then be shared across sites and third-party providers for a wide range of use cases to help organizations optimize costs and productivity.

By providing consistent unified data for applications throughout the enterprise, Uptake Fusion greatly reduces the time to obtain value from industrial OT data. According to the company, the solution can be implemented in less than two weeks and can be scaled up or down quickly.

Some of the benefits of Uptake Fusion include:

• Improved business agility: it connects data silos for collaboration across multiple platforms, plants, and the enterprise.

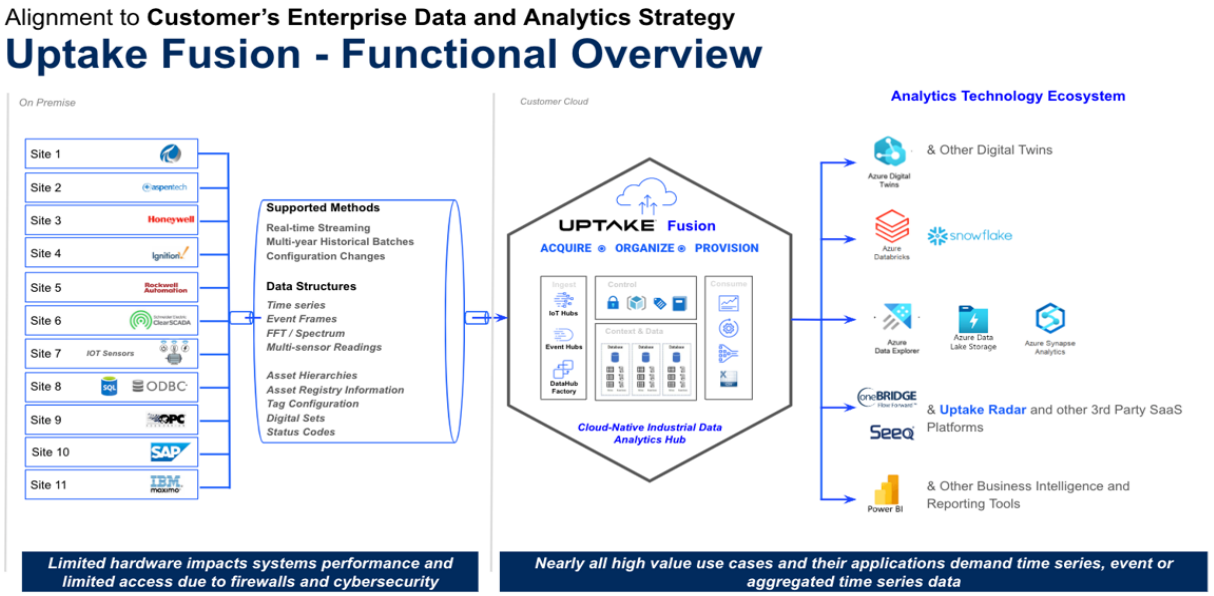
• Efficiency improvements: allow organizations to develop applications quickly and empower workers for operational excellence.

• Cost effective: the SaaS based solution offers flexibility to organizations and does not require high upfront cost.

• Fast deployment: the solution can be implemented in less than two weeks and can be scaled up or down quickly.

• Flexible hosting: the solution can be installed in customer's cloud or Uptake's cloud.

• Security: the solution is Purdue-Model compliant and can be tailored to meet customer's security needs.



Source: Uptake Fusion

Success Stories at ARC Forum

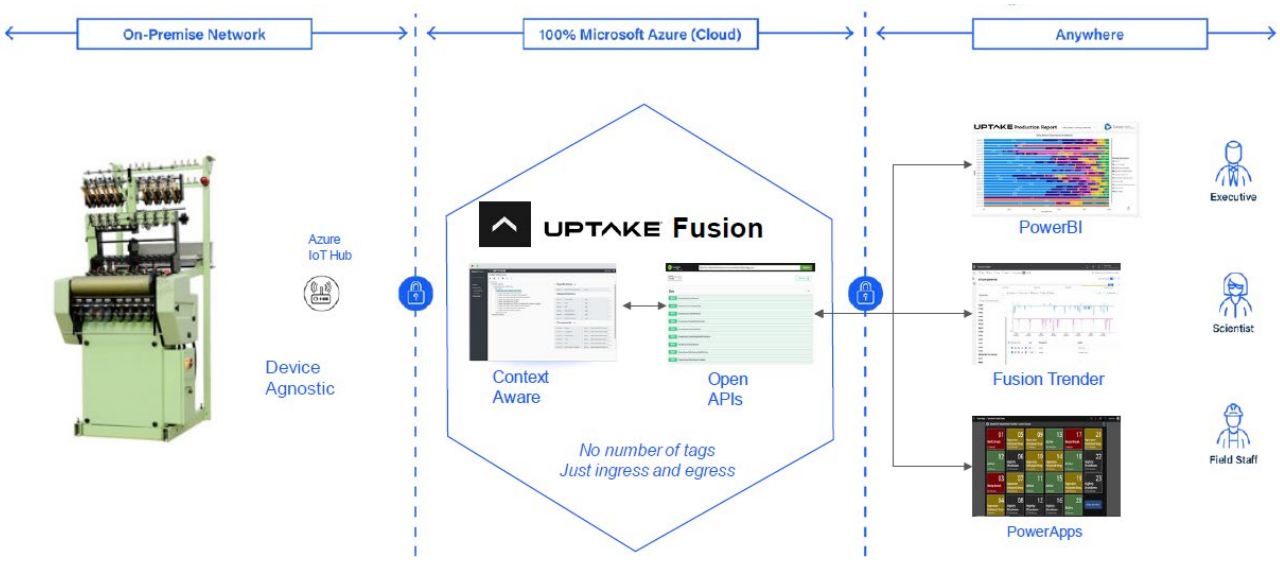
At ARC Advisory Group's recent Industry Forum in Orlando, Florida, asset management was among the key topics discussed. Manufacturers from various industries shared how they are employing different technologies to help with their asset management initiatives.

Davey Textile's Transformation Journey

Dan King, Vice President of Production and R&D at Davey Textile Solutions shared with the audience details on the company's efforts to achieve 100 percent overall equipment effectiveness (OEE). OEE, which measures how well manufacturing operations are utilized compared to their full potential, is the gold standard for the industry, pointed Mr. King.

Davey Textile that offers wide variety of textile solutions utilizes wide range of assets including looms, finishers, laminators, lasers and more. In its effort to improve OEE, the company added sensors to these assets to be able to track their health. However, the company still faced challenges relating to manual data collection, limited data availability and analysis capability, minimum visibility and collaboration, and slow decision making. The company partnered with Uptake to help them address these challenges.

Davey Textile wanted to collect, organize and present its asset data in an actional format. With Uptake Fusion, they are now able to securely collect data in an automated manner. The contextualized data in Uptake Fusion is easy to understand, maintain and is the single source of truth for everyone involved. The data is leveraged by number of different applications such as



Uptake Fusion Brings Data Together from Different Assets and Makes it Available for Use by Different Applications (Source: Davey Textile Presentation at 2023 ARC Industry Forum)

Power BI, Fusion Trender, PowerApps to help the company with better decision making, eliminate bottlenecks, improve equipment uptime, maximize production capacity, and ultimately achieve its goal of 100 percent OEE. And it's already paying off. OEE before the implementation was 30 percent and now Dan reports they are over 54 percent. Alvaro Rozo, Head of Product and Technology, Uptake Fusion joined the panel discussion and highlighted how industrial data hub solutions such as Uptake Fusion can help companies like Davey Textile accelerate their analytics and digital transformation journey.

Phillips 66 Operations Data Success

Chris Glenn, Director of Refining Ops Systems at Phillips 66 shared with the audience details on how the company is addressing business challenges by leveraging its OT data. The Texas based energy company collects deep, rich data from their operational technology systems. The problem is it was trapped in site-specific on-premises historians. Moving it to the cloud would unlock a lot of new insights and operational efficiencies. While the mission was clear, the path to get there was complicated. Yet, the company understood overcoming complexity was essential to meeting their business transformation vision.

Phillips 66 had to breakdown information silos but that wasn't a straightforward process. While moving data is easy, piping data with all of its context is complicated. Operational data was sitting safely behind firewalls. Any movement had to include all the context needed to make the data useful, but it also had to be moved in a cybersecure manner. Traditional methods would take years to move all their data. They didn't have years.

While early use cases were clear, the team knew an enterprise-first approach to their data strategy would best serve their business transformation goals.

- Real-time and interpolated data feeds were built to support persona driven use cases across the enterprise – from operators to data scientists.
- Operational data is co-located with business system data for maximum context and flexibility of analysis and reporting.
- Secure, easy access - internally and externally - was a high priority to optimize use of the data.
- Automation of data pipelines was essential to maintaining the system over time.

"We can't always anticipate how the data will be used, so we built a data pipeline that would adapt as the needs of the business evolve. Uptake Fusion has several capabilities that made it essential for making OT data not only available, but usable," said Chris Glenn.

With Uptake Fusion there is no custom to pipe time series data, securely and with their full context, into the Azure platform. As a bonus, the use of Uptake Fusion made it easy to upgrade from TSI, to ADX.

- Secure, scalable OT data pipeline, with context
- Fits within current data strategy and architecture
- Allows them to meet current and future demand
- Significantly reduced runway by 12-18 months +

Specific uses cases were the catalysts for their journey, but Phillips 66 is building for the long-term. It is now the means to many ends.

- Automated Reporting/Dashboarding
- Improved data visibility driving actionable insights
- Applied machine learning and automation
- Simulation engines improve planning
- Data is available to feed a focus on energy sustainability

Recommendations

The ability to manage data at a central hub and build applications can empower manufacturers with the agility to respond faster and more efficiently, collaborate and provide better intelligence that will ultimately affect the bottom line. Manufacturers who are looking to accelerate their transformation journey and use data across multiple departments, plants, and sites should consider investing in data hubs.

A SaaS based industrial analytics data hub, such as Uptake Fusion can be a cost effective, efficient, and scalable solution for manufacturers. A central data hub can greatly reduce the gap between manufacturing, IT, and business because it makes it easier for users to develop more standardized applications. Being able to connect data, and provide end-to-end intelligence leads to improved profitability (reduced costs) and agility to innovate quickly.

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Acronym Reference:

ALM	Asset Lifecycle Management
APM	Asset Performance Management
CPAS	Collaborative Process Automation System
CMM	Collaborative Management Model
CPM	Collaborative Production Management
CRM	Customer Relationship Management
DCS	Distributed Control System
EAM	Enterprise Asset Management
ERP	Enterprise Resource Planning
HMI	Human Machine Interface
IIoT	Industrial Internet of Things
IoT	Internet of Things
IT	Information Technology
MES	Manufacturing Execution System
OT	Operational Technology
PAM	Plant Asset Management
PLC	Programmable Logic Controller
PLM	Product Lifecycle Management
ROA	Return on Assets
SCM	Supply Chain Management
WMS	Warehouse Management System

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