EPICOR

Data as a Service in Production Environments

The Trends and Technologies Powering the Future

Contents

Plant Engineering and CFE Media & Technology recently presented a webcast, Data as a Service, Trends and Technologies Powering the Future of Manufacturing, sponsored by Epicor.

Kerrie Jordan, Group Vice President of Product, at Epicor, spoke as follows.

I'm glad to have the opportunity to speak with you today about these important topics. I will share with you what we at Epicor see happening across the manufacturing industries, and offer guidance based on our work with successful manufacturing organizations. We'll address the following topics:

- Creating a satisfying work environment
- Trends and technologies shaping data as a service (DaaS) and automation
- Overcoming implementation challenges
- Best practices of data-first manufacturers
- Getting started

The people you work with are an important part of any job. We'll begin by seeing what manufacturing workers had to say about the trends and technologies powering their future. Epicor recently published a survey of 600 frontline workers for our first-ever "Voice of the Essential Manufacturing Worker" report. You can find it on the Epicor website.

Let's look at some highlights to gain insight into how broader industry issues impact factory personnel—including supply chain disruptions, increased consumer demand and economic uncertainty.

A Satisfying Work Environment

Of those surveyed, 52% said morale is high at their company, 41% said it was average, and 7% said morale was low. Of course, we'd want these numbers to be higher, but morale is still generally high at these businesses. Those with high morale pointed to flexible work schedules, more paid time off, and receiving bonuses or higher pay as contributing factors. High morale is tied to more income, but also to better work-life balance.

600
frontline workers surveyed

52%
say morale is high

60%
say they prefer to work for a technology-driven or more sustainable factory

#1
High cost of raw materials is biggest challenge

56%
plan to leave their job

80%
say company is making upskilling a priority

The number one challenge facing those surveyed is the high cost of raw materials. That may seem like a C-suite issue, but frontline workers experience its impact on a day-to-day basis. Supply chain disruptions and rising costs can mean materials they're used to working with aren't available. Maybe they need to use different, lower-cost materials. Lower quality could impact the rest of the production line. Spending more on raw materials could mean budget cuts elsewhere. As a result, deliveries get behind. That might mean heavier workloads, making it more difficult to take time off.

We found that people want change—56% of those surveyed said they plan to leave their job in the next year. Generally, they said that they're looking for more flexibility, higher pay, and a better work-life balance.

It may seem surprising, but 60% of respondents said that they would prefer to work for a more technology-driven or even at a more environmentally sustainable facility. They even said they'd be willing to take a 10% pay cut to work for a company striving to be technology-driven or to attain sustainability.

Elsewhere we asked, what's most rewarding about your job? The number one answer, I don't think you'll be surprised by it, is building something tangible with their work. Second is participating in the company mission, being part of something bigger, and making a difference. For many, this means addressing challenges like sustainability and advanced manufacturing through technology implementation.

Another interesting find was that 80% of respondents said their company made upskilling a priority.

Key Learnings

It's a powerful message when six out of 10 respondents say that they would take a pay cut to work for a more technology-driven or at a more sustainable factory. Most people want to work for a modern organization—one that's aware, that cares for the community, and that seeks to have a broader positive impact on the world around them.

Make technology and sustainability a priority

Provide flexible work schedules and paid time off

Continue to invest in upskilling your workforce

Consider outreach programs to nearby high schools, trade schools, and community colleges. Historically, manufacturers focused on quality and customer service and hired based on these needs. That can be expensive and lead to instability over time. Instead, empower people on your team with technology to support expanded skill sets.

Provide flexible work schedules and more paid time off. Workers crave flexibility. If necessary, they'll seek a new employer to find it. We see here the influence of the pandemic. Modern technology platforms enable the communications required for hybrid work or working from home. These platforms support business automation, empowering workers with information needed to be efficient anywhere and collaborate better than ever before.

Continue to invest in upskilling. As you bring in new technologies, keep investing in people, too. Not only do upskilling programs—including online courses, apprenticeships, and on-the-job training—result in qualified workers and an engaged, skilled workforce, but also those benefiting know their employer is investing in them and their future.

Data as a Service

Data as a service, in this context, is a business model where machine-readable data is exchanged for something of value. In fact, at least several technologies enable this kind of value exchange.

Storing data in the cloud is key to enabling data as a service. Cloud technologies scale with the amount of data being exchanged. A data lake contains all of an organization's data in a raw, unstructured form and can store data indefinitely. A data warehouse contains structured data that has been cleaned and processed, ready for strategic analysis based on pre-defined business needs. Business intelligence and analytics tap into these data warehouses or data lakes to find and transform information—allowing its continued use and visualizing it for decision support.

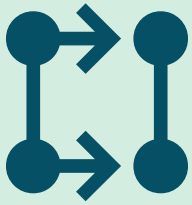
Chatbots can explain this gathered data or the resulting visualizations in plain language. Tools like OpenAI look at data and explain it to the everyday business user. Machine learning and artificial intelligence (AI) make predictions based on that data. eCommerce websites and marketplaces allow users to exchange data as transactions. Data as a Service enables new revenue opportunities in the form of service-based or subscription-based models. How supply chains work is changing.

Example

Robotic Process Automatic

A form of business process automation that makes it easy to define a set of instruction for robots to perform

Example



Workflow Automation

Integrating your business applications to automatically set off action in one system based on an event in another

Example

AP Automation

Using machine learning and content services to digitize invoices, read, route, track, and ultimately pay suppliers

For example, the Epicor Parts Network is one of the world's largest automotive aftermarket eCommerce networks. Its purpose is to allow buyers and sellers to share real-time parts inventory and pricing information. It contains 50 years of data. It catalogs more than 17 million unique parts and processes. It processes 700 transactions per minute every day. With this network, the right automotive part gets to the right place at the right time.

When you take an automobile to a mechanic, it's likely the dealer is part of Epicor Parts Network. The network quickly determines the part needed for the vehicle make, model, and year, whether it's in stock or available at alternate locations, and gets the car back on the road as fast as possible. That's data as a service in action today.

Automation takes that data and creates further value, using equipment to perform essential tasks efficiently and quickly, and by means of technologies that act based on the flow of data through systems or processes.

Examples of this include robotic, workflow, and accounts payable (AP) automation. Robotic process automation is growing in popularity within manufacturing. Business process automation defines a set of instructions that tell robots to perform repetitive tasks on the shop floor.

Workflow automation is also growing in popularity, especially since manufacturing organizations typically depend on a variety of cloud-based applications. These could include enterprise resources planning (ERP), email systems, or customer relationship management (CRM). It could even come from human resources.

Workflow automation integrates business applications to automatically trigger one system based on events in other systems.

For example, companies with Epicor ERP solutions might also have Salesforce. They set up workflows using APIs (application programming interfaces) to create a record in Salesforce when a new purchase order is created in ERP.

AP automation uses machine learning and content services to digitalize invoices for accounts payable. As invoices are issued, they are scanned, read, routed for approvals, tracked, and stored in an online repository—helping ensure that suppliers get paid quickly and accurately.

Data as a Service Consequences

Why are these technologies and their benefits important to manufacturers? In many cases, it's because they tie back to the voices of the essential manufacturing workers. A prime objective of those pursuing data as a service or other type automation is a more effective workforce, based on management listening to staff and equipping them with better tools and technologies.

Using data to automate processes or generate insights into an industry, the business and its operations or customers makes workers more productive. It also helps decrease unmanageable workloads, leading to higher worker satisfaction and retention. Empowered with data about schedules, material shipments, and other operational data, employees gain greater daily flexibility.

Perhaps product quality suffers.

A plant might see high personnel turnover rates. Data and automation alleviate workloads and improve employee morale, rebalancing the load among several roles. This technology supports the longer-term goals of the team by empowering staff with visibility into schedules, materials shipments, and other operations data.

Production capacity may increase.

Data gathered from the production line supports improved throughout and reduced downtime. If your business is seeking reduced costs and lower risk, consider automation and data as a service. You'll learn how to automate repetitive tasks as well as where automation can cost-effectively boost shop floor employee health and safety.

Automation of data entry and triggering events from one system to another without manual intervention.

Having this capability reduces errors that would otherwise emerge later, when they're more difficult to solve. Fast response to supply-chain disruption with a data-first approach consolidates data from multiple sources, reduces duplicate data, and improves collaboration within the supplier ecosystem. This may give you a stronger negotiating position.

Develop a trusted partnership with customers.

You'll be able to offer more personalized customer experiences, while maximizing sales and efficiency at the service counter. This can be done using configure/price/quote (CPQ) tools providing real-time 3D visualization for customers, presenting possible solutions based on configurator rules.

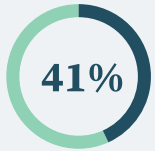
Four Top Technologies

The survey also asked what top four technologies the respondents most wished their company used. First is big data, which is closely associated with data as a service.

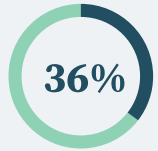
A plant may already be collecting data through supervisory control (SCADA), a manufacturing execution system (MES), the industrial internet of things (IIOT), or enterprise transactions. Application solutions might include for business intelligence, with data warehouse tools and cloud-based technologies that gather, synthesize, and analyze data, not to mention scale with the tremendous amounts of data generated. It's not surprising to see this level of interest in Big Data, but it is exciting. This is a critical foundation for a future of data as a service.

Top Four Technologies

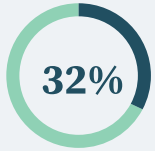
Our respondents said that their organization uses the following technologies (and we asked them to choose all that apply):



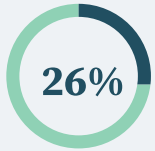
Big Data
Many of our respondents' organizations are gathering, synthesizing, and analyzing data from across their company to give them insights into their operations.



Robotics or Artificial Intelligence
Respondents' organizations are also using robots or AI to improve and automate the manufacturing process.



Augmented Reality
They're also using AR to visualize the manufacturing process, track data, QA, and more.



3D Printing
Respondents' are also seeing their companies use 3D printings as part of their manufacturing process.

Second comes robotics or artificial intelligence. Robotics can assume potentially hazardous shop-floor activities, those that are more repetitive, or any tasks that pose a risk to employee health and safety. The third technology the survey pointed to is augmented reality, to visualize and track the manufacturing process. This can be of great value in quality assurance. The possibilities of augmented reality also include more interactive, enhanced work instructions. It will be exciting to see how these innovations will take shape in coming years.

Finally, there is considerable interest in 3D printing, but we were surprised to see that 3D printing didn't have a higher profile. However, as many of you may know, challenges seem to remain in determining how to incorporate 3D printing into an automated production process. Additional technologies are discussed in the survey results.

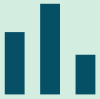
Implementation Challenges

Implementing software applications in manufacturing enterprises is challenging. Most of these challenges involve concerns about data, as follows:

- Getting a handle on data
- Maintaining data governance over time
- Avoiding overcomplication
- Protecting data privacy and security
- Working through organizational resistance to change
- Building in business resilience

Top Challenges to Overcome

Getting a handle on your data



Maintaining data governance over time

It's easy to overcomplicate

Protecting data privacy and security 24/7

Organizational resistance to change

Building in business resilience for better flexibility

Some companies have fallen behind. They don't know what data they have. They don't know where it is stored. They assume it's protected to a greater or lesser extent, but at the end of the day, they're not too sure about any of it. Getting a handle on all that data is where most companies start.

Knowing how much data you have helps from a budgeting perspective when it comes time to choose a solution. Consolidating the data and gathering it before searching for insights can be tackled in phases.

Companies must protect data privacy and security—all day, every day. As data is collected from a variety of sources, prioritize privacy and security while making data accessible and meaningful. Compliance regulations, such as the California Consumer Privacy Act (CCPA) or the European Union's General Data Protection Regulation (GDPR) change often and may be applicable to your business. If you are unsure of what government regulations apply, I encourage you to seek legal counsel.

Data gathered must be protected with multiple layers of security. Consider multifactor authentication (MFA). It might be 2FA, two-factor authentication, for log-ins. Cloud applications and access points should be encrypted and backed up. Have disaster recovery in place, set up firewalls for on-premises resources, and install antivirus software.

Develop a plan or standards to maintain data governance over time. As data is gathered from a variety of sources, take steps to help ensure it's current and usable. Have a plan and standards to maintain data and to help ensure that it's complete and accurate. Good data hygiene comes from good data governance.

A modern technology platform with security controls in place supports managing data as it evolves over time, in conformance with the applicable data standards. It helps you scale successfully with volume support, storage, and processing with modern APIs.

Change management is challenging. Organizational resistance slows efforts to transform a company into a data-first organization. As with any other transformative effort, pay attention to the team and its concerns. The organization may be used to collecting and working with data in a certain way. Culture change is a key part of becoming a data-first company. Involve the workforce early. Capture their ideas. Form a key team to champion the new approach. Now is the time to offer career development for the workforce.

It's easy to over-complicate this process. Data overload is real. Projects get bloated. Instead, stick to the strategy. Define the problem to be solved and paint a clear picture of what success looks like. How should progress be measured? Pick three to five key performance indicators (KPIs) to guide data-collection decisions. Baseline metrics help avoid data overload. This could include measures such as production volume, downtime, inventory costs, and production capacity.

Build business resilience to respond to a changing market. Something often overlooked is how economic data impacts operations. Incorporate market and industry data into your planning, including supply chain status, material shortages, weather events, or geopolitical developments. Participate in industry trade groups. Sign up for industry data networks such as the Epicor Parts Network.

Best Practices Review

For a data-first strategy, consider the following best practices:

View security, privacy, and access control as top priorities

Continue to nurture and build these into your initiatives. As more technology is integrated into the organization, expand your resources into the cloud.

Be comprehensive.

Seek out applicable external data sources, including market and industry data. Look to the data networks already out there to help build and strengthen your data library.

Seek out professionals.

Work with a trusted advisor group, including legal, cybersecurity, and technology resources across the enterprise. At Epicor, we work with Microsoft Azure and Amazon Web Services (AWS) for cloud infrastructure and platform as a service. These massive companies have resources that can contribute to your success.

Choose a technology platform that's open, adaptable, and scalable.

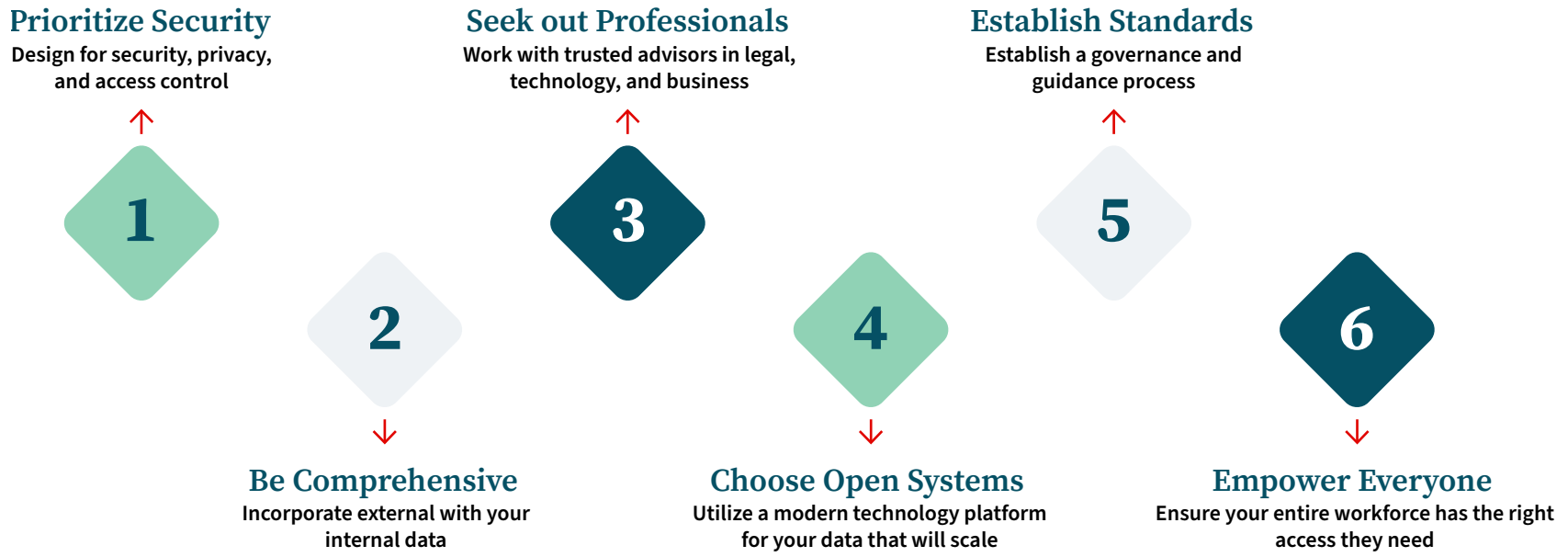
A robust, reliable technology platform supports the organization, helps anticipate change, and remains flexible. It easily connects with open, secure APIs.

Many platforms now have a low-code, no-code user interface or user experience that supports even the average business users with clear guidance on how to model processes. Even BI tools have low-code/no-code user experience. Grow, an Epicor solution is embedded within our Epicor Kinetic solution to provide a dynamic, productive user experience.

Have a governance and guidance process in place for challenges that arise. A data governance team oversees the data collected, how it's managed, and the way in which it's organized. Accurate data leads to better analysis and precise insights that drive results.

Empower the team.

Help ensure that the members of the organization have access to the data they need, when they need it. This should drive investment and budgeting decisions: some tools have a per-user price, some charge by usage or data storage, and some allow unlimited users.



Get Started

Are you ready to become more data focused? Here are five steps to consider when beginning your data transformation.

1 - Identify your data champion.

They can kick-start the initiative. A data-first approach requires not only operational changes, but a cultural shift as well. The leader you select will need both communications skills and credibility with the team.

2 - Define the business objectives.

Start collecting data, but define the business objectives for the data. Don't over-complicate things. What KPIs or key performance indicators do you need to track over time?

3 - Understand the data and what may be missing.

For example, to better understand production throughput, do you have comprehensive data on items produced as well as the time it takes to produce them? How do calculations change over time during certain shifts or with certain materials? How do you stand up to industry benchmarks?

4 - Expand the team for greater organizational reach and impact.

Empower the data champion and project team with an expanded roster of experts. Generally, IT professionals have the greatest insight and visibility across the business in how data is being used. For expertise external to your company, look to those who have experience in solving specific data concerns.

5 - Understand that it's a journey.

Set milestones and keep the team aligned with them. Celebrate success. Iterate on the strategy over time. Account for your resources and investments.

In today's world, we're witnessing first-hand how industries are evolving, blurring the traditional demarcation lines of how goods are made, bought, and sold. What makes it all possible is the plausibility of a data-first approach to manufacturing excellence. It will be fascinating to watch as data-driven business networks define manufacturing's future.

Kerrie Jordan is Group Vice President of Product, at Epicor.
She leads the strategic direction of Epicor cloud-enabled industry productivity solutions to deliver high value, innovation, security, and insights for Epicor customers.

EPICOR

We're here for the hard-working businesses that keep the world turning. You're the companies that make, move, and sell the things we all need. Trust Epicor to help you do business better. Your industry is our industry, and we understand you better than anyone. By working hand-in-hand, we get to know your business almost as well as you do. Our innovative industry solution sets are carefully built to fit your needs and respond flexibly to your fast-changing reality. We accelerate ambitions, whether you want to grow and transform, or simply become more productive and effective. That's what makes us the essential partner to the world's most essential businesses.

Contact Us Today: info@epicor.com | www.epicor.com