Trends in Industrial Digital Transformation

For the past three years, Emerson has reached out to its customers to understand the trends, successes, and pain points as companies continue to digitize their operations. This year's survey focused on digital transformation, analytics, collaboration, and scalability.

Survey Method

Emerson commissioned The Harris Poll to conduct one-on-one telephone interviews with customers identified by Emerson. This report summarizes the views of 17 customers in Operations and IT, spanning multiple world areas and industries, including Chemicals, Oil & Gas, Refining, and Metals & Mining.

Executive Summary

CEOs have embraced and are driving digital transformation.

- Support of digital transformation from senior leadership is driving visibility, prioritization, and most importantly, a culture change in the organization.
- Resources, both dollars and human assets (e.g., data scientists), are being added and allocated, spurring a faster evolution.

"It comes from the very top of the company overall…the overarching aligned strategy has permeated through the whole company in terms of digital themes and specific digital projects that are value-driven."

"Demands of changing manufacturing are coming from the top-level executives and down. The executive leadership is demanding that we need this technology, whether it be productivity or cycle time, and they are supporting it by allowing investments. We are asking for resources and we are slowly growing those resources in our plants."

Enterprise-wide strategies and full-company support exists today, unlike in previous years.

- There appears to be little discord between sites and corporate when it comes to the valuable role and use of data.
- While corporate tends to be more knowledgeable about how to use the data, sites are open to learning and using it more – especially given the "top down pressure."

"We have centers of excellence around IIoT, around data science, and the apps to bring the operators value in the field. That was all driven from the top."

"The people at the plant floor should care about the business objectives because ultimately they're a key enabler of achieving them. But the disconnect happens when there are really different sets of problems to solve."

Data transformation and analytics represent a shift from *collecting* data to *using* data to drive decision making.

- IIoT is the hardware and software needed to collect data from geographically and functionally different "devices." Data transformation is then using the data, driven largely by analytics.
- Analytics are primarily being used to optimize manufacturing, increase efficiencies, and enhance safety and environmental health.

"Digital transformation or smart manufacturing is really about the broader picture. It's not about technology, it's about how you use the technology to transform your business to do things completely differently tomorrow than you do today."

"Having these data and analytics will help us make real-time decisions, and be more agile, and most importantly also run the business in a much more safe and reliable manner."

Analytics projects stem from both top-down and bottom-up. Successful initiatives engage the sites to identify problems and implement solutions.

- In some cases, corporate strategy teams are offering analytics solutions to sites suggesting ways in which the data can be used for optimization.
- In most cases, however, individual sites are identifying the problems they need solved.

"I'd say getting the sites engaged early to really spend time on the value proposition, and honestly, the sites are going to be the ones with the business problems that need to be solved, they are going to need to bring that to the corporate folks."

"I see corporate typically looking out to the world and getting it down to a digestible number of solutions, number of vendors, and then working with the sites to determine what's going to be the best fit for that specific location."

For analytics to be effective, cross-functional representatives need to work together.

- Business and operations leaders are often identifying WHAT to focus on and prioritizing which problems need solving.
- IT, and those more familiar with analytics, layer in the HOW to solve the issue leveraging analytics.

"My team, and the data science team, working hand-in-hand, sharing ideas, I think has a huge impact. Being the experts of capturing data, flowing data, and the data science team having the expertise of analyzing the data."

"In my role I can bridge the business challenge with the analytics. I can say 'this is the type of data we need for the data set for the data scientist to do that type of analysis.'"

Collaboration continues to be a priority and companies are getting better at it. Companies are:

- Better aligning the goals of corporate, business units, and sites;
- Establishing committees and working groups, including representatives from cross functions, with a common goal of guiding data analytics;
- Building out teams including operations personnel who best understand how to apply analytics to each company's unique needs.

"A big challenge you have is the business has objectives and the operations have objectives. The key is they have to be linked, and we have to design our data and our information to integrate those two perspectives."

"I think collaboration is critical for any of these new technologies to be successful. When you're starting to look at solving problems, you need operations involved, you need engineering involved, you need a lot of time from both corporate and plant."

People and workflow are critical for success.

- Digital transformation is a paradigm shift in the corporate culture. It has to connect with the workforce to be successful.
- The ultimate goal of digital transformation is to improve workflow processes…how can we do this better, faster, cheaper, safer. There is no value if these goals are not achieved.

"There is a lot of work to look at our basic work processes and understand the change in the people and roles involved and how to shift those so that the intended users of the technology really understand how to leverage it."

"Is there a clear value proposition and one that is clearly implementable by the business unit…if there is no one to really leverage it or it can't be leveraged into a direct line value or there is no business process to absorb those insights, then it is not going to yield real value."

Data visualization is a critical element for adoption.

- As companies begin leveraging analytics, being able to make the data easily consumable and meaningful is critical to success.
- Once users understand the data, they appreciate its value, which supports the cultural shift and builds momentum.
- More importantly, it sparks ideas for how data analytics can be further applied, advancing adoption.

"You can generate a lot of data. You can overwhelm them, so you do need the tools to drive action to become actionable data. You need the tools in place to be able to use the data. I think that's part of our culture change."

"Because data sitting in tables doesn't mean anything to anybody. It's certainly got to be presented and it's got to be presented in a fashion that has a wow factor."

Data and architecture are critical components for analytics and are inhibiting cross-site or enterprise-wide analytics deployment for some.

- Most companies have *a lot* of data but need to make sure they have the *right* data for analytics to be successful.
- In addition, companies need the right architecture to consolidate all the data and make it work together.
- Despite years of focus on building out their networks, concerns linger about speeds, democratized data, and network challenges impeding the full adoption of analytics.
- Beyond the issue of being focused on problems specific to individual sites, a robust network connecting sites to enterprise could be slowing broader analytic solution adoption.

"We need to re-architect our data infrastructure and platform in order for us to move forward to really exploit the analytics."

"As the data architecture improves, and we make it easier for a wider audience of people to access more and more data and information, it's also keeping pace with them realizing their abilities and their limitations on what to do with it and what to do with it correctly."

Despite the enthusiasm for analytics, deployments tend to be localized vs. enterprise-wide.

- Solutions tend to be selected for specific applications or to solve problems specific to a given business unit or site.
- Problems solved by analytics, at this point in the evolution, may be solved site or plant-wide rather than enterprise-wide due to differing infrastructures.
- Successes, so far, have largely been centered around proactive maintenance and environmental/safety concerns.

"Every business unit has its own data analytics needs. Is it going to be enterprise-wide? I don't think that's going to happen any time soon because of the legacy systems and their unique needs."

"For existing plants it's about adding capability to existing assets at a relatively low cost. For new plants, you can take advantage of new technologies like wireless sensors and can do things more remotely."

But there are attributes that make a project scalable.

- Projects that are scalable demonstrate value in pilot programs and have applications on a broader scale.
- But the architecture must be in place for scalability.
- Global scaling is an unmet need.

"A barrier to scalability is not having well-defined success criteria so that it's difficult to determine what success is. You need to have a well-defined ROI and really understand what the true benefit is in dollars."

"It would be cool to be able to work with a company that has the breadth of process knowledge and breadth of process analytic solutions that can help us scale things globally."

Companies are split between 'making' and 'buying' analytics solutions.

- Some buy if they don't have the capability in-house or if it's a more common, scalable solution, as developing analytics solutions isn't a core competency.
- Some have a preference to build their own analytics in-house for reasons including: cost, IP, security, and unique needs of the organization. The more complex or unique the analytics/solutions, the greater the desire to develop in-house.
- More companies are beginning to bring in data scientists to enhance their analytics capabilities.

"Our general philosophy is to buy it when you can and only build it when it is absolutely necessary and critical to differentiating our value."

"We are partnering with companies to develop models for us. We don't have the analytics expertise in-house to be able to do that. However, we are in the process of developing a center of excellence around analytics and dashboarding and trying to create a competency in our organization."

There is much vendor hype and skepticism as companies assess vendor quality and fit.

- Everyone seems to be getting into the business of analytics. Vendors are making promises to 'solve all their problems' with little knowledge or proven success. They are learning as they go.
- There is too much focus on the shiny new technology, and not enough focus on understanding of one's industry and the problems they need the technology to solve.
- Companies want to work with vendors who are willing to collaborate on custom solutions to solve their problems.

"What the vendors have to do is work more closely with their customers to understand their current capabilities and maturity and target the right milestones as smaller steps for bigger success. Right now, they are going too big, too quickly."

"The best vendors will understand your problem, see it from the operations perspective and try to solve the problem of the operations."