Industrial
DataOps

A Practitioners Perspective

INTRO

Transforming data into actionable information to make better business decisions is not a new concept. Having a single version of the truth that organizations can depend on to run their business has remained an elusive goal for decades. Cloud technology and AI/ML have raised the expectation of finally delivering on this elusive goal. However, many of the issues persist, and the perceived value remains frustratingly unfulfilled. This paper delves into some of the core challenges that remain and proposes a DataOps philosophy that can help organizations overcome these challenges.

PROBLEM STATEMENT

Organizational expectations of being able to do more with less continues to be our reality. If companies cannot sustainably transform how people work and make decisions and scale it in the organization, then the "bungee effect" occurs, where the new way gains some momentum but then stalls, and people revert to how their comfort zone and how they have worked previously. Technology has not been the limiting factor in the pace of change for quite a while; the pace of change depends on how quickly and effectively an organization can establish a coherent strategy, engage the stakeholders, communicate consistently, execute, to scale and sustain the change. It's not just about the data.

With people and processes established as critical to success, we can NOW talk about the challenges associated with the data. When people think about what data they would like to have available to them, they are thinking about this data in the context of their role and how they will ultimately use the data to make decisions. The business users in these cases generally have limited visibility into the arduous journey this data has made before arriving on their screen.

The data challenges and inherent complexities of transforming data into useful information are many in an OT environment, including acquisition, collection rate optimization or compromise based on various use cases, storage, retrieval, missing data, outliers, noise, time alignment, data damaged in transit, data context lost when exporting from native databases, integrating different types of data, manual entry/transposition errors, and more. Sufficient data curation is required to get to a ready for business consumption state. This is not a one size fits all activity, a risk-aware approach is needed, and depending on the business criticality, different data curation standards and processes should be defined and applied to establish an optimized Confidence Factor. This activity usually requires combining contextual process knowledge with an understanding of how the information will ultimately be driving which decisions and the associated opportunities and risks.

PEOPLE

Fewer people than ever are responsible for operating safe and productive industrial facilities, and technology is outpacing people. Data is being produced faster than we can consume it, and people are changing roles more frequently, not in roles long enough to get to the needed level of competency. The core competencies required are evolving quicker than people can adapt, and different generations have been accustomed to learning in different ways, making it difficult for one size fits all training. The aging workforce and the pandemic have also changed our work environment, which presents further challenges. The days of having a dedicated expert available have largely been replaced with fewer but more senior generalists. training and equipping tools need to evolve to accommodate to train and equip the next generation of generalists. In the IT/OT convergence space we call these 'Industrial DataOps Practitioners' – and the world needs more of them.

PROCESS

Organizations should have a methodical approach to unlocking trapped business value, rather than relying on a particular technology as a hammer looking for a nails. This approach involves identifying and unlocking the value that is currently locked away in various stranded assets, including individuals, teams, projects, skills, knowledge bases, and datasets.

You can't improve what you don't measure. Taking the time to baseline the as-is for data availability flow and quality, current undocumented micro-factories hidden within people's day to day tasks, current governance model(s), and current confidence factors influencing perceived data quality, is a step frequently missed and irretrievably lost once project or changes are well underway. Missing this step often results in not identifying and addressing the potential failure modes up front and is also a common root cause for 'expectation creep' which can make communicating and backing up the value created from the project much more difficult.

TECHNOLOGY

There are more technology options than ever before. Although the opportunity potential technology offers is vast, the resulting increased complexity of technology choices and their interdependencies poses challenges of it's own. One of the common failure modes with technology projects is that the technology is often positioned as the silver bullet solution and insufficient time and resources are allocated to the other critical success factors. According to a recent study, 71% of AI projects are struggling due to data-related issues, and 35.8% of AI/ML initiatives involving operational data are failing to reach target ROI.

INNOVATION

Innovation is a key driver of growth and competitiveness in today's business landscape. However, innovation is not just about developing new technologies or products. It is also about developing new ways of working and new business models that can help organizations to stay ahead of the competition.

To drive innovation, organizations need to have a culture of continuous improvement. This means encouraging experimentation and risk-taking, as well as fostering an environment of collaboration and knowledge sharing. It also means having a clear understanding of the different types of innovation, including incremental, disruptive, and radical innovation, and how they can be used to support the organization's business objectives.

Innovation also requires organizations to be able to identify and exploit new opportunities. This means having a clear understanding of the market and the competition, as well as the organization's own strengths and weaknesses. It also means having a clear understanding of the trends and technologies that are driving change in the industry, and how these can be leveraged to create new opportunities.

Finally, innovation requires organizations to be able to execute on their ideas. This means having the right people, processes, and technology in place to turn ideas into reality. It also means having a clear understanding of the risks and challenges associated with the potential change and having strategies in place to mitigate these risks and challenges.

CONCLUSION

In conclusion, Industrial DataOps presents both challenges and opportunities for organizations seeking to transform data into actionable information. While cloud technology and AI/ML have raised expectations, many issues persist, and the perceived value remains unfulfilled. To overcome these challenges, organizations must address people, process, technology, and innovation.

People play a critical role in Industrial DataOps, but fewer individuals are responsible for operating industrial facilities, and technology is advancing faster than people can adapt. Organizations need to train and equip the next generation of generalists known as Industrial DataOps Practitioners. Additionally, a culture of continuous learning and collaboration is crucial for success.

Process plays a vital role in unlocking trapped business value. It involves identifying and leveraging stranded assets such as skills, knowledge bases, and datasets. Establishing a baseline and defining what success looks like, along with a robust governance framework, ensures focus on critical success factors throughout the lifecycle of technology programs.

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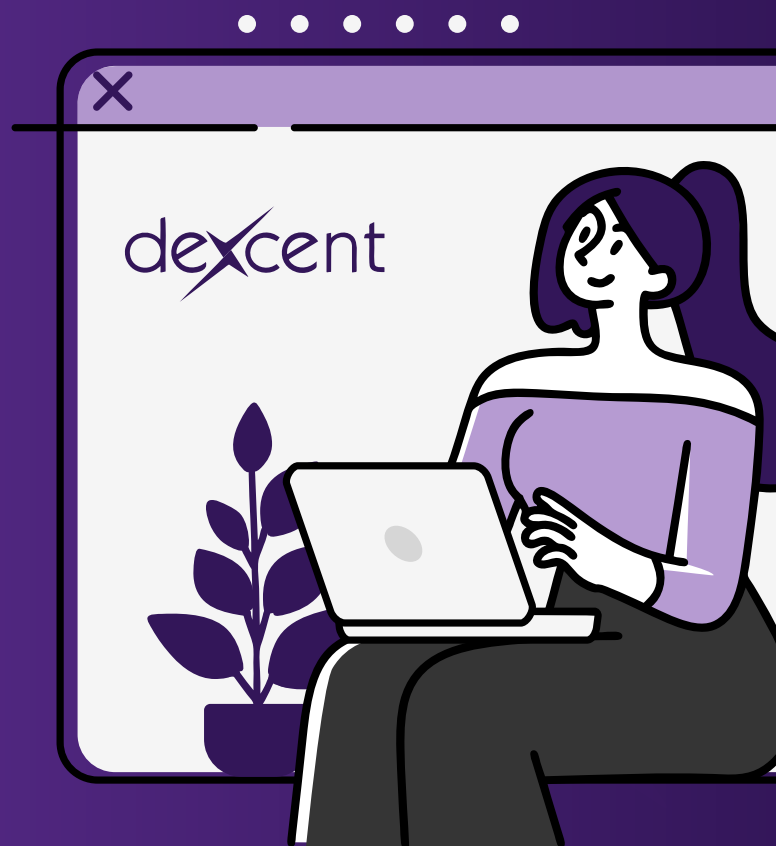
Technology offers numerous options but also brings complexity and interdependencies. It is essential to avoid positioning technology as a silver bullet solution and allocate sufficient resources to other critical success factors. An agile approach is necessary, considering the accelerating pace of change and the potential obsolescence of deliverables. Balancing best-in-class "point solutions" with a unified platform requires evolving industry standards and practices.

Innovation is crucial for growth and competitiveness. Organizations should foster a culture of continuous improvement, encouraging experimentation and risk-taking while promoting collaboration and knowledge sharing. Understanding different types of innovation and identifying new opportunities in the market are key. Execution requires the right people, processes, and technology, along with strategies to mitigate risks and challenges associated with change.

By addressing these pillars of Industrial DataOps—people, process, technology, and innovation—organizations can unlock the true value of their data, make better business decisions, and stay ahead of the competition in today's rapidly evolving business landscape.

CONTACT US!

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