



Weaving a Digital Fabric

Implementing Data Integration for
Supply Chain Orchestration



INTRODUCTION

The complexity of a successful supply chain demands highly effective yet agile orchestration. A durable, flexible “digital fabric” — the interconnected network of digital technologies, platforms and data streams within the supply chain ecosystem — is now a must-have in nearly every industry but is particularly crucial in electronics.

Past attempts to monitor, assess or mitigate supply chains through data modeling have traditionally been limited by the scope of data capture. Previous models might only map a few strands of global shipping paths, leaving out the steps along the way, often handled by other stakeholders utilizing their own data collection platforms. Because important variables were often missing, insights from data analysis were clouded by uncertainty.

Digital fabric initiatives, by contrast, endeavor to build a far more comprehensive view of supply chains, interweaving massive volumes of real-time transactions. This effort results in higher-resolution detail from such technologies as RFID tags and IoT sensor data, but also broadens data capture by stitching multiple network databases together — even those operated by different enterprises.

While building a digital fabric architecture for relevant supply chains represents an extensive multi-year effort to establish the infrastructure, the potential benefits of a comprehensive voluble data model may have a powerful, game-changing impact on how global supply chains are orchestrated, with unprecedented capabilities for all parties involved.

This success guide explores the challenges and potential business implications of a wide-scale digital fabric initiative. Offered as a case study, the ongoing efforts at Molex — one of the world’s largest electronic interconnect providers — illustrate a proven strategy for implementation, validating specific initiatives taken to achieve the manufacturer’s long-term goals for optimized inventory management, reduced lead times and enhanced agility across thousands of global threads.



PIECING TOGETHER DIGITAL FABRIC

For electronics companies exploring a buildout of digital fabric for supply chain orchestration, it is important to understand the technologies involved and the potential challenges and barriers to implementation.

Just as a city may undertake a large-scale infrastructure project like a bridge or a highway, companies often choose to invest in a digital fabric platform with long-term and somewhat fluid goals in mind. While some new capabilities may be more immediate than others, the process towards comprehensive tracking models is typically a multi-year endeavor.

Exploring a few key milestones of project execution will show why digital fabric initiatives require significant time and investment.

INTEGRATION AND COLLABORATION

While data collection, analytics and automation inside an enterprise can be instigated by a single directive of a CXO, weaving together digital fabric must first play politics with stakeholders both internally and externally. Integrating diverse systems, applications and data sources across the supply chain and facilitating real-time data exchange requires a round-table conversation among stakeholders, including suppliers, manufacturers, distributors and retailers. As efforts at integrated platforms scale and evolve, third-party logistics (3PL), fourth-party logistics (4PL) and transport carriers may also play important roles in data-sharing arrangements.

The first hurdle is human, with each party taking actions to ensure transparent and trustworthy data exchange. Agreements must be made to share datasets, implement sufficient hardware connectivity at the many nodes across a network and in the longer term, coordinate with future automated actions that may be created through the platform. This involves close collaboration and frequent communication among supply chain partners throughout the project.





DATA MANAGEMENT AND TRANSPARENCY

The second preliminary challenge is technical. Diverse platforms may make measurements differently, in varying languages and computing formats, or may calculate key indicators in their own way. To get data on the same page across organizations, an extensive process of evaluating the quality, reliability and interoperability of inputs is a necessary part of any initiative.

New tools in artificial intelligence and machine learning (AI/ML) can assist in this effort to normalize the variance in data attributes inside an integrated platform, translating data collection from one operator to correspond with metrics from another. Automated data management may also aid in calculating the degree of uncertainty of data model insights in a “risk-adjusted” approach.

ANALYTICS AND VISIBILITY

Once architecture for an integrated platform is designed and populated, the work of digital fabric implementation can move on to address a wide variety of supply chain improvement goals. Advanced analytics tools leverage this consolidated data to generate actionable insights, predict demand patterns, identify potential risks and optimize resource allocation.

Digital fabric provides end-to-end visibility and transparency into the full extent of a supply chain, allowing stakeholders to track the movement of goods, monitor inventory levels and assess the status of orders and shipments in real time. This visibility offers unprecedented capabilities for proactive decision-making and effective risk management to mitigate disruptions and delays.

The end game is to select the best automated toolkit for each enterprise and incorporate it into day-to-day business practices, establishing seamless collaboration and communication among supply chain partners. This real-time use of supply chain data across many locations integrates into a Business Digital Operating Model (BDOM), which is critical to institutionalizing the digital fabric. This organizational improvement is achieved through establishing secure messaging platforms, collaborative planning tools, shared dashboards or other custom applications.

A LOOK INSIDE DIGITAL FABRIC AT MOLEX

When Molex embarked on its endeavor to create a digital fabric framework that was needed to continue efforts to develop leading capabilities in the industry for its end-to-end (E2E) digital supply chain, a complete list of capabilities needed to be established. In planning, it was clear the company's supply chain orchestration vision would not be realized without addressing proper linkage and visibility around the following capabilities, systems and platforms:

- Demand / supply planning & real-time scenario planning
- Strategic supplier performance scorecard
- End-to-end logistics visibility
- Enterprise-wide procurement intelligence platform
- Supplier collaboration network
- Global trade compliance automation
- Network modeling and process mining
- NPD / RFQ decision-making from design to sourcing to manufacturing

Once these capabilities have been successfully integrated into operations, Molex expects to drive significant tangible economic value for the enterprise. Although the journey towards digital fabric is not yet complete, to date, the initiative has already increased overall employee satisfaction and enhanced the customer experience.



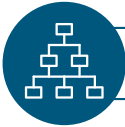
KEYS TO SUCCESSFUL IMPLEMENTATION

Implementation of this complex undertaking requires thoughtful strategy. By collaborating across the many teams that work to make supply chain orchestration successful, a four-pronged strategy was developed to address all the key functions and teams needed to integrate. These pillar focus areas emerged as talent, operating models, software and finally data — regarded as the fuel for AI-driven insights.



Talent Acquisition and Development

A critical success factor in Molex’s digital transformation journey is the acquisition and development of talent. The company has focused on building a team with diverse expertise, including specialists in web development, human centric design, data architecture, data quality and supply chain management. This multidisciplinary approach ensures that Molex has the necessary skills to design, implement and maintain a sophisticated digital fabric. Moreover, with the importance of talent in successful implementation, fostering a culture of continuous learning and innovation has been proven to encourage employees to stay abreast of the latest trends and technologies in digital supply chain management.



Business Digital Operating Model (BDOM) Integration

A well-designed BDOM is essential for institutionalizing the application of digital fabric capabilities across the organization. The BDOM serves as a blueprint for the transformation of business processes, guiding the integration of technology into employee workflows. This model emphasizes agility, efficiency and customer-centricity, enabling Molex to respond swiftly to supply changes and customer needs. By standardizing processes and tools, the BDOM ensures consistency and quality in the deployment of digital solutions.



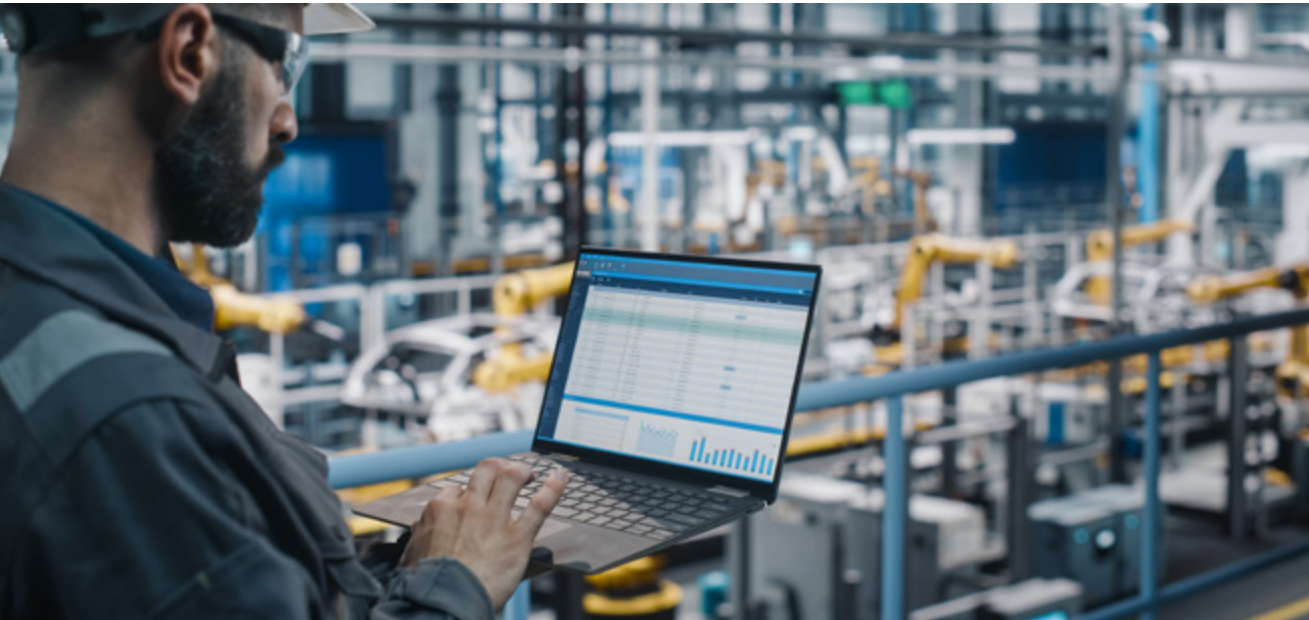
Software Solutions

Taking a strategic approach to software development, Molex carefully considers the make-or-buy decision for each digital solution. This strategy involves a thorough assessment of internal capabilities and market offerings to determine the most efficient and cost-effective path. By balancing in-house development with external procurement, the company ensures that it can leverage the best available technologies while maintaining control over critical systems and processes. This approach not only enhances the scalability and flexibility of the digital fabric but also supports innovation and rapid deployment.



Data as a Strategic Asset to Enable High Trust, Low Risk Adoption

In Molex’s digital fabric, data is not just a resource but a strategic asset that drives innovation, decision-making and operational excellence. The company has invested heavily in building a robust data infrastructure that supports the collection, storage and analysis of vast datasets. This infrastructure includes advanced analytics platforms, AI and machine learning tools that transform raw data into actionable insights. Molex’s data strategy emphasizes the importance of data integrity and security, ensuring that all data used in decision-making processes is accurate, reliable and secure.



PUTTING THE INSIGHTS OF DIGITAL FABRIC TO WORK

The Molex supply chain orchestration initiative and digital fabric enhancements represent improvements that are already helping customers maximize real-time responsiveness as market conditions shift. After data is captured and a patchwork of networks stitched together into a single model, the final step is to distribute the insights to decision-makers across the network. Both suppliers and internal departments can rely on real-time assessments of conditions as well as future projections to optimize their operations.

Getting digital fabric insights onto the dashboards of the personnel who can make best use of them involves software integration into the existing BDOM system. A similar strategy may be implemented to software infrastructure at each of the external stakeholders of the platform.

A carefully crafted BDOM can help organizations deploy and scale advanced model capabilities in ways that deliver mutual benefit. Updated business processes and new operating models are equally important for successful implementation. Operating models can be thought of as institutionalizing the new capabilities for end users. For example:



Real-Time Data Integration

Because digital fabric integrates data from various sources, users now receive a holistic view of the supply chain. This real-time data integration helps in monitoring and managing the supply chain efficiently, reducing delays and improving responsiveness.



Enhanced Visibility

By creating a digital replica of the supply chain, stakeholders can visualize the entire process, from raw material procurement to final product delivery. This visibility helps in identifying bottlenecks, predicting disruptions and optimizing operations.





Improved Decision-Making

With access to comprehensive and real-time data, actors throughout the supply chain network can make informed decisions. Predictive analytics and AI-driven insights facilitate proactive management, enabling all parties to anticipate issues and mitigate risks.



Collaboration and Connectivity

Digital fabric fosters collaboration among different stakeholders in the supply chain. Seamless communication can solve coordination problems that previously wasted time and resources.



Scalability and Flexibility

Companies can adapt and expand their supply chain models in response to changing market demands and conditions. Additionally, more advanced monitoring and prediction tools can be built on top of the platform, developing new and more powerful capabilities.



Automation and Efficiency

By leveraging automation technologies, digital fabric models integrated with BDOM processes reduce manual intervention, minimize errors and accelerate routine tasks, leading to greater efficiency and cost savings across the board.

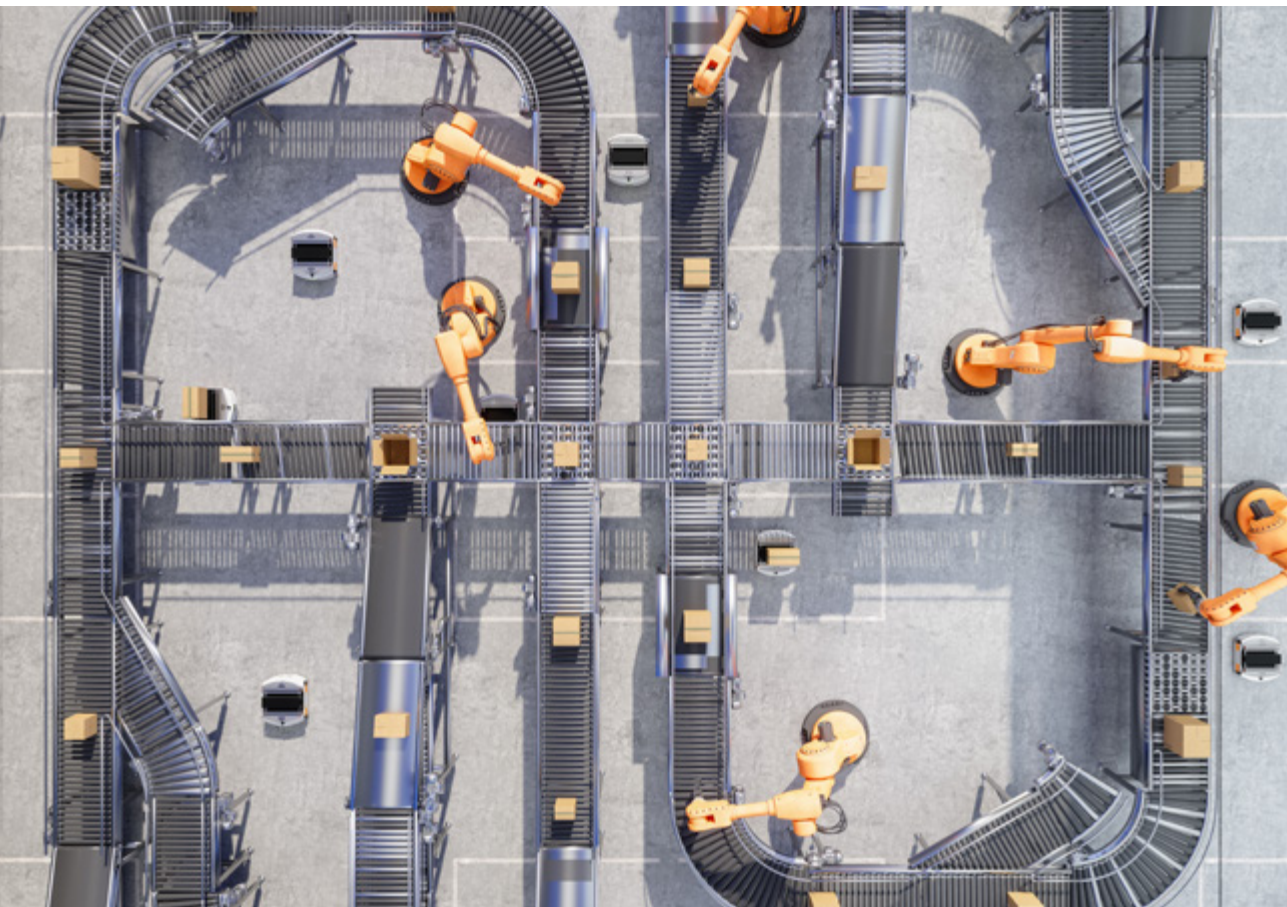


Risk Management

The ability to simulate and analyze different scenarios helps companies identify potential risks and develop mitigation strategies in the event of supply chain disruption. This proactive approach to risk management avoids the high costs associated with unexpected failures in supply lines.

Overall, a well-designed integration of digital fabric platforms leveraging BDOMs can provide enormous value. Organizations can now anticipate, adapt and mitigate in the face of supply chain situations that were previously opaque and uncertain.

By setting sights on both a comprehensive cross-organization data platform and a transformation of processes through BDOM tools, Molex is taking a more agile and responsive approach to supply chains that unlocks new opportunities, drives future growth and generates long-term competitive advantages.



A STRATEGIC DIFFERENTIATOR

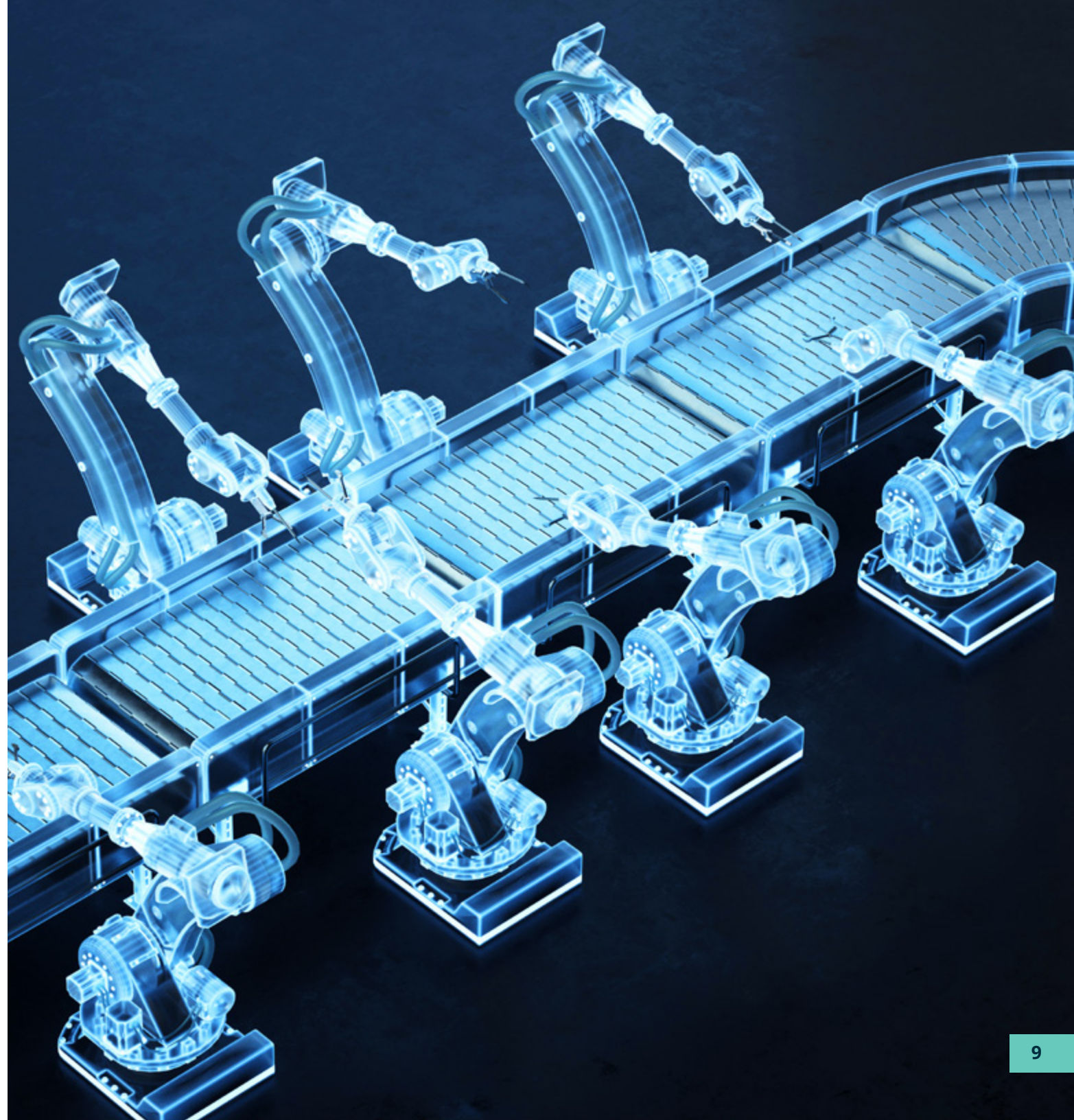
Digital supply chain orchestration is a cornerstone of the Molex strategy for achieving operational excellence and delivering superior value to customers and stakeholders. The company's investment in digital fabric development reflects its commitment to leveraging technology to drive innovation, efficiency and agility. As Molex continues to refine and expand its digital capabilities, it sets a new standard for supply chain management in the digital age.

The journey towards a fully integrated digital fabric is ongoing at Molex, with key milestones and objectives clearly defined for the future. This digital fabric vision is supported by a strong leadership commitment, a culture of innovation and a relentless focus on customer satisfaction. By aligning its digital strategy with its broader business goals, Molex is leading in supply chain innovation and building a more adaptive organization that responds to the evolving needs of the global marketplace.

EXPLORE MORE SUPPLY CHAIN INSIGHT

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