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POINT OF VIEW

The Critical Role of Data in Supply Chain Management

Introduction

Data is critical to gaining actionable insight into supply chains, and yet it is one of the core challenges facing organisations. Whether data is non-existent, unavailable, unreliable, or outdated, organisations may lack the data to properly manage and report on their supply chains in line with growing regulatory and social demand.

Data is generated and collected daily across multiple systems within a supply chain and has created a rise of data siloes. This segregation of data has led to disconnected and inaccurate data sets that are out of reach to those who may gain insight from it. This fragmentation makes it harder for decision makers to get a clear, concise, and truthful/reliable view of their supply chain.

The existence of (reliable) data is the first challenge. From here, getting permission to access and then creating the means to access the data follow closely as an inhibitor to data-driven supply chain management. Where these three principles come together, organisations can start working towards creating the means for visible, traceable, and transparent supply chains.

> This POV explores the centrality of data to providing the means for effective and efficient supply chain management, and the challenges posed in its absence.

Data Sources in a Supply Chain

Supply chain ecosystems generate masses of data daily from multiple sources, internally and externally from suppliers. This includes behaviour and activity up- and downstream within a supply chain, to provide data on manufacturing, logistics, distributors, retailers, and consumers. Recording and storing this data will depend on the individual organisation.

Internally, customer relationship management (CRM) platforms, enterprise resource planning (ERP), and point-of-sale systems, and more all contribute data on inventory levels, customer behaviour, and sales.[1]

Externally, supplier data, market trends, sustainability data, and economic indicators can be used to make key business decisions.

The increased use of Internet of Things (IoT) devices in logistics provides real time data on the movement of goods, the environment (temperature, lighting), and system performance (battery, usage, wear and tear).

Gaining access permission and integrating these data sources is the first step to building a strong understanding of a supply chain, making accurate predictions, and providing compliance evidence. Once there is a semi-comprehensive view of the available data (and meta-data), gap analyses can determine what data is lacking so improvements can be made to capture or gain access to it.

Current Challenges

Today's supply chain environment necessitates near real-time data to drive decisions, increase operational efficiency, and maintain compliance. All of these require a continuous, accurate, and up-to-date flow of data, as well as permission to access and share it.

Without a centralised database for information and a way to securely share it with relevant parties, management teams can be left unprepared for audits and changes in consumer demand. This is why supply chain data management is vital.

Supply chain data management involves the collection and analysis of data throughout a supply chain. Each point in the supply chain, from the sourcing of raw materials such as cotton, to the delivery of the completed product, is driven by data.[2] This data may come from internal sources and require communication to third parties, or originate with suppliers and require integration into an ESG platform.

However, supply chain data management comes with challenges; first and foremost, the absence of data. These are some of the challenges to efficient and effective data management:

Disparate Data Sources

Supply chains produce data across multiple sources. Integrating these disparate sources into a unified platform is a complex and lengthy project that requires in-depth understanding and the collaboration of numerous partners.

[1] Exploring The Role Of Data Analytics In Enhancing Supply Chain Efficiency - IABAC
[2] Supply Chain Data Management and How it Improves Your Decision-Making (CData Software)

The initial challenge arising from disparate data sources is the knowledge of what and where these sources are and how they store data. Data can be stored in different structures, formats, and locations, requiring clear and concise strategies on how they will be integrated to ensure the integrity and reliability of the data is maintained.

The disparity of data sources can also come down to the standards of storing data in different industries and organisations, from paper records to blockchain, the need to even collect and store the data, and the way in which the data is stored in one system to the next. All these factors can hinder the ability to integrate and access supply chain information, and 'fixing' the issue could take years.

Potential solutions to the challenge of disparate data sources can include the use of APIs and other integration methods to streamline dataflows into a single, secure, data platform to create a unified source of information for privileged supply chain partners. This platform can then be leveraged to improve cost management, decision making, inventory management, and more.

Solving the challenge of non-existent data is a larger undertaking, but will rely on understanding the as-is and to-be states and data requirements to know what is missing and the criticality of the information.

Data Accuracy and Reliability

Once you have been provided with access to supply chain data, ensuring accuracy (reliability and timeliness) and quality is critical for decision-making and reporting. Risks that could impact the integrity of supply chain data include human error from manual processes (collection and input), disconnected databases that miss information, and slow data updates.

The use of inaccurate or incomplete data can have a cascading effect throughout a supply chain, leading to delays, disruptions, and increased costs. For example, an inventory error could cause a stockout, affecting customer satisfaction, sales, and production.

Detecting and ensuring data quality is essential. If data is to be used to provide evidence of compliance, it needs to be accurate and reliable. This means it has come from a reliable source and be up to date/real-time. Ensuring this reliability involves monitoring and recording the meta-data of the information, such as the author, date and time of creation, data source, and if the data entry has been edited – by whom and when.

Internal data standards may also mean that one organisation requires data that their partner doesn't collect or stores in an incompatible format. If this is critical to regulation, how can this data be obtained? Establishing clear guidelines of where data is used, who can access it, continuous updates, and using reporting tools will be central to automating and managing supply chain data efficiently between partners.

Ensuring the integrity of this data will then require robust data validation, data cleansing, and data quality standards.

Data Privacy

With the shift towards digital supply chains and the increased utilisation of data, retailers must ensure sensitive information is protected. The privacy and security of sensitive data within supply chains is critical to ensuring the protection of customer and business information (personally identifiable) in line with regulations including GDPR, as well as the protection of competitive trade secrets.

When creating a collaborative data environment, safeguarding and securing information should always be a leading consideration. Cybersecurity practices must align throughout the supply chain and security posture should be closely monitored and secure data exchange should be established.

A key barrier to creating a collaborative and transparent supply chain stems from the political constraints of sharing potentially competitive insight such as cost-effective manufacturing processes or speedy suppliers that reduce lead times. Ensuring you only share the information you want or *have* to share is central to the buy-in of partners, making security a key factor to supply chain data management and insight.

In a similar vein, retailers handle vast amounts of customer data. Organisations should already have clear data governance and compliance procedure in place to manage these considerations internally. When looking to share data with supply chain partners, there is a need to establish clear external data governance practices, implement consistent access controls, encrypt data, and audit and assess data handling regularly to adhere to data privacy laws such as GDPR and PCI-DSS.[3] A proactive approach and robust security measures will promote trustworthiness and best practices within supply chain management and ensure retailers stay compliant.

If the solution to supply chain data insight is a single data platform, all data can flow through the system but remain inaccessible to any users and organisations that have not been granted permission from the data owner.

[3] Data Security and Privacy Challenges in the Digital Supply Chain (copperdigital.com)

Connecting Data

With these principles established and understood, organisations and supply chains can start to map out how they can securely and comprehensively connect their data to improve insight.

1. What data exists?
    a. What data is needed and by whom?
        i. How can this gap be bridged?
2. Where is the data from and where is it stored?
3. What is the format of the data?
    a. Is this universal or does it change from one organisation to the next?
4. What security is placed on the data?
    a. Is it sensitive and does it fall under the remit of regulation?
        i. If so, how can you ensure it is kept secure from some and available to others?
5. Is the data accurate and reliable?
    a. If not, how can it be improved?

Connecting supply chain data can provide a plethora of benefits, from improving lead times and business decisions to satisfying customers and the regulator. Delivering this capability hinges on a shared and collaborative desire and effort to do so paired with understanding of the data.

Regulation

A main driver for connecting data stems from the need to evidence regulatory compliance. Retail and industry wide regulations keep operations intact, improve quality of products, ensures privacy, and promotes sustainable practices.

To ensure regulations are met, retailers must securely collect and manage the relevant data needed for audits and reports. This data can be spread throughout their supply chain in the cases of modern slavery and scope 2 and 3 emissions.

> It's one thing to say you are compliant, it is another to evidence it.

To effectively evidence compliance across the supply chain you need a tamperproof data trail that can be used for reports and audits. Data visualisation can be used to present complex data from across a supply chain in a concise manner using easy to read dashboards and metrics displayed in real-time.

Solutions

Connecting your supply chain data can seem like a complex and daunting challenge, and you are probably right, but there are several solutions to effectively enable seamless integration. These include, but are not limited to, integration and automation platforms, APIs, and collaborative platforms.

Integration and Automation Platforms provide capabilities to connect systems and applications to facilitate data exchange into a single location.

Platforms like this offer a range of capabilities such as pre-built connectors, data mapping, and workflow automation. Utilising platforms designed for integration and automation can simplify the process of connecting systems by becoming a centralised place for managing data flows.

Many of these pre-built connectors and adapters support various protocols to enable connectivity with diverse data points so your teams do not have to create bespoke integrations and APIs for every system you require. Another feature of many integration platforms is monitoring dashboards and management consoles that provide visibility to identify issues, troubleshoot problems, and optimise performance.

Adding automation capabilities can streamline the processes of accessing supplier portals by using robotic process automation, creating reports by inputting data into designated fields, and alerting humans to tasks that require completing when necessary. This can reduce the strain on staff to manually collate data, and reduce the time and cost of creating regulatory reports.

Overall, integration and automation platforms are a great way to seamlessly and cost-effectively collect data across supply chains.

> See Responsiv Cloud Automation Platform for more information

APIs (application programming interfaces) serve as intermediaries that allow different software systems to communicate and exchange data effectively. They enable systems to share data in a standardised way, regardless of the underlying protocols or technologies.

APIs also provide flexibility, for example, if a retailer needed to add a supplier system as another endpoint, APIs can do this without disrupting existing process or systems.

Collaborative Platforms facilitate real-time communication, collaboration, and information sharing amongst partners in a supply chain. These platforms can enable collaboration on tasks such as inventory management, order fulfilment, and demand planning.

Collaborative platforms allow retailers to share critical information that allows them to make informed decisions. They also provide analytics and reporting tools that provides insights into supply chain performance and other actionable data to ensure retailers are making informed decisions. Platforms like this enhance visibility and collaboration across supply chains, enabling stakeholders to work together effectively.

Conclusion

Navigating the complexities of supply chain data and utilising it efficiently presents challenges for retailers, from issues around data accuracy to accessing data from disparate data siloes. These challenges can be daunting to overcome, and can create more issues in the process of unpicking the problem such as data privacy and security requirements that are central to any integration solution.

Issues of a lack of data can be identified by understanding the current state of data availability and the requirements of each supply chain partner to uncover what is needed, why, and in what form. Once this task of data mapping has been completed, agreements can be made over collection and sharing of any new, necessary, data.

Despite the challenges associated with managing and sharing data throughout a supply chain, there are multiple solutions that can mitigate risks and streamline processes.

Embracing technologies such as integration and automation platforms and APIs can enhance visibility throughout supply chains. With a strategic approach, leveraging technologies and collaboration, retailers can see new opportunities for efficiency and growth.

How can Responsiv help?

Responsiv specialise in integration and automation solutions, with expertise in data management and security.

If the data exists, Responsiv can integrate it.

Assuming you have permission to access and use data from your supply chain partners, we have the skills to integrate it to a central location that can be utilised for secure insight.

Responsiv has a wealth of knowledge around the retail sector and supply chain management. We help build infrastructure that will support both today and tomorrow's needs.

Responsiv Supply Chain Insights Project

Responsiv is currently working with Innovate UK and partners, Responsiv is developing a platform to gather and provide supply chain insights for the management of discarded textiles in the UK. This project will support the ideas of supply chain compliance, traceability, visibility, and where possible, transparency.

Around 1.05-1.75 million tonnes of textiles is thrown away in the UK annually, 360,000 tonnes of this is clothing that ends up in landfill.

Our goal is to create a body of information that can be used to support investment in UK recycling facilities and capacity. Responsiv will collaborate with partners to research improved ways of standardising data categorisations across textile sources for sufficient and valuable recycling supply.

Responsiv will be using its expertise in integration and automation to map out a previously undefined supply chain. A key part of our role in this project is making data secure and giving the consortium control of their data sharing.