

COURSE CODE: LSM302

COURSE TITLE: SUPPLY CHAIN DATA VISIBILITY & ANALYTICS NETWORKS

COURSE UNIT: 2-UNITS

MODULE 1

Module 1 introduces the foundational concepts of supply chain data visibility, setting the stage for understanding how real-time information enhances operational efficiency and decision-making. This module begins with Lesson 1, which defines supply chain data visibility and explores its importance, highlighting key components and case studies on visibility challenges. Lesson 2 delves into the role of information technology in achieving end-to-end data tracking, focusing on systems like ERP, RFID, and cloud computing. In Lesson 3, the module addresses the constraints to real-time data sharing, examining legal, technical, and organizational barriers and proposing solutions to improve data flow. Finally, Lesson 4 introduces digital twin technology and the Industrial Internet of Things (IIoT) in logistics, illustrating how these innovations enhance supply chain visibility and operational efficiency through case studies. By covering these topics, Module 1 equips students with a comprehensive understanding of the principles and technologies that underpin effective supply chain data visibility.

LESSON 1: INTRODUCTION TO SUPPLY CHAIN DATA VISIBILITY

Introduction

Supply chain visibility (SCV) is the ability to track, monitor, and understand all activities within your supply chain. It involves having a detailed view of products and services as they move from the source or supplier to the end customer. SCV means tracking the movement of products, materials, and information throughout the entire supply chain. It's a company's ability to keep track of raw materials, components, and final products, whether in batches or individually. Real-time supply chain visibility provides a complete, end-to-end view of a company's logistics, inventory, and warehouse management processes and people.

Lesson Outcomes

By the end of this lesson, students will be able to:

1. Define and explain the concept of supply chain data visibility and its significance in modern logistics.



2. Describe the essential elements required for achieving end-to-end visibility in supply chains.
3. Evaluate real-world examples of challenges faced by companies in achieving supply chain visibility.
4. Discuss how real-time data enhances decision-making and operational efficiency in supply chain management.
5. Develop strategies to address common challenges in achieving supply chain data visibility.

Importance of Data Visibility

Supply chain visibility is essential for effectively managing extended and outsourced supply chains. It helps businesses identify risks, capitalize on opportunities, and build trust with stakeholders. Enhanced visibility is crucial for driving supply chain sustainability and provides benefits such as improved risk management, increased operational efficiency, and greater customer trust. Real-time data and analytics provide a solid foundation for data-driven decision-making, enabling companies to make informed choices regarding production schedules, inventory levels, and supply chain strategy. With increased globalization making supply chains more intricate, visibility plays a pivotal role in effective risk management by allowing for early identification and mitigation of potential disruptions. Ultimately, supply chain visibility translates to quicker decision-making and more efficient operations, helping businesses meet and exceed customer expectations.

Key components of supply chain data visibility

- **Data Capture:** Collecting data from various sources within the supply chain, including suppliers, manufacturers, logistics providers, and retailers. This data can include information on inventory levels, order status, and shipment tracking.
- **Data Integration:** Consolidating and integrating data from different sources and systems to create a unified view of the supply chain. This often requires



the use of technology solutions like Enterprise Resource Planning (ERP) systems, Supply Chain Management (SCM) software, and data analytics tools.

- **Ability to determine the current status:** A key characteristic of a high-visibility supply chain is the ability to determine the current status of any element of the supply chain at any given moment and investigate it for more details.

Visibility Challenges (Potential Case Studies):

- **Risk management:** Visibility allows companies to proactively identify and mitigate risks in the supply chain, such as supply disruptions, quality issues, and geopolitical factors.
- **Compliance and traceability:** Visibility enables companies to track the origin and journey of products, which is important for compliance with regulations and ethical sourcing.
- **Identifying potential risks or unethical practices:** Supply chain visibility offers a comprehensive view of suppliers' operations, facilitating early identification of potential risks or unethical practices and allowing for timely corrective actions.
- **Impact of external factors:** Using data helps companies better understand the impact of external factors on their supply chain so they can proactively anticipate disruptions and take steps to ensure a continuous flow of operations.

Case studies on visibility challenges

- **Compliance and Regulations:** A consumer products manufacturer ships to destinations worldwide from a central distribution center in the United States. Importing and exporting represent a significant portion of their business, so trade compliance and safety are key to smooth operations. They manage risk using a cloud-based system accessible to all supply chain partners for collaboration. This system forces accountability through managed user access, and digital copies of shipping



manifests are linked with the load/appointment data. Audits and any faults found are executed and dealt with in real time.

- **Data Fragmentation and Integration:** Manufacturing supply chains often involve various systems, departments, and partners, leading to data fragmentation. Data might reside in different software systems, spreadsheets, or databases. Integrating and consolidating this data into a single, coherent view can be complex and time-consuming, especially if the systems used by different stakeholders are not interoperable. Wavetronix, a global manufacturer of traffic technologies, overcame this challenge by deploying cloud-based supply chain management software to increase visibility across its business and uses a cloud-based ERP system with analytics to connect ideas and information throughout the business.
- **Lack of Real-Time Data Sharing:** Delays in data sharing, manual data entry, and reliance on outdated methods like email or phone calls can result in information gaps. Inefficiencies in data collection and sharing processes can prevent real-time insights, leading to difficulties in responding quickly to disruptions or changes in demand.
- **Collaboration and Partner Interaction:** A retailer managing inbound containers at a seaport receives emails with spreadsheets containing lists of containers and POs arriving at port, another set of emails for clearing Customs, and another one for delivery to their distribution centers.
- **Blockchain for Food Supply Chains:** Blockchain provides visibility of exchanges and reliable data in fully-digitized supply chains, creating authenticity and traceability by storing supply chain data and making it difficult to change. Walmart is one of the firms that adopted blockchain because of the volume of adulterations and their potential harm⁴.
- **Ethical Practices:** Hope for Justice and Slave-Free Alliance partnered with Exiger to adopt its supply chain visibility platform and pinpoint modern-day slavery.

Summary

This lesson introduces the concept of supply chain data visibility (SCV), defining it as the ability to track and monitor products, materials, and information as they move through the



supply chain. It emphasizes the importance of SCV for identifying risks, capitalizing on opportunities, and building stakeholder trust. The lesson also highlights the need for capturing and integrating data from diverse sources to achieve a unified view, as well as determining current status.

Self-Assessment Questions

1. What is supply chain data visibility, and why is it important?
2. What are some key components of supply chain data visibility?
3. How does real-time data improve supply chain operations?
4. What are some common challenges in achieving supply chain visibility?
5. How can companies benefit from improved supply chain visibility?

Answers

1. Supply chain data visibility refers to the ability to track and monitor goods, services, and information in real-time across the supply chain. It is important for enhancing efficiency, reducing risks, and improving customer satisfaction.
2. Key components include data collection systems, data analytics tools, communication networks, and stakeholder collaboration.
3. Real-time data enables quicker decision-making, reduces inventory costs, and enhances customer service by providing accurate and timely information.
4. Common challenges include data integration issues, lack of standardization, and inadequate technology infrastructure.
5. Improved visibility allows companies to respond quickly to disruptions, optimize inventory levels, and enhance supply chain resilience, ultimately leading to cost savings and improved customer satisfaction.





