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# SUPPLY CHAIN TECHNOLOGY CERTIFICATE

## Supply Chain Technology Certificate Overview

Technology remains critical for supply chain organizations. In the upcoming years, supply chains must adopt new technologies that improve decision-making to enable a sustainable future.

**ASCM's Supply Chain Technology Certificate** introduces emerging technologies, explains how to implement them for organizational improvement and provides an overview of how they directly affect supply chain performance.

The self-paced online program includes 20 hours of education and a comprehensive final exam. After passing the exam, learners will receive a certificate and a digital badge.

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# Blockchain

## Objectives:

- Define blockchain technology and discuss how it works.
- Compare and contrast public and private blockchains.
- Discuss the benefits and drawbacks of blockchain technology.
- Identify factors to consider when implementing blockchain technology.
- Explain how blockchain technology is used in supply chains.

## Topics:

### What Is Blockchain?

Defining Blockchain

Why Is Blockchain Important?

Key Elements of a Blockchain

How Blockchain Works

Blockchain Consensus

### Types of Blockchains

Different Types of Blockchain Networks

Public Blockchain

Private Blockchain

Public versus Private Blockchains

### Advantages and Disadvantages of Using Blockchain

Benefits of Blockchain

Smart Contracts

Non-fungible Tokens (NFTs)

Threats to Blockchain Security

### Blockchain Implementation

Factors to Consider When Implementing Blockchain

Implementation Steps

### Advantages and Disadvantages of Using Blockchain

How Is Blockchain Used in Supply Chain?

Case Study: An American Multinational Retail Corporation

Case Study: PharmaLedger

Case Study: A Global Leader in Logistics

Case Study: An American Multinational Automobile Manufacturer

Case Study: A Swiss Multinational Food and Drink Processing Company

## Advanced Analytics and Automation

### Objectives:

- Define advanced analytics and automation.
- Compare and contrast descriptive, diagnostic, predictive, prescriptive, and cognitive analytics.
- Explain the process of data mining and challenges the process can present to a company.
- Discuss data storage options and cloud computing security concerns.
- Describe how artificial intelligence and machine learning are used in supply chain.
- List some of the skills employees need to work with advanced analytics and automation.

### Topics:

#### What Are Advanced Analytics and Automation?

Advanced Analytics

End-to-End Analytics Process

Automation

Automation—Robotics

#### Advanced Analytics Methods

Operations Research and Management Sciences

Descriptive, Diagnostic, Prescriptive, Predictive and Cognitive Analytics

Dashboards

#### Data Mining

The Importance of Data and Data Mining

The Data Mining Process

Data Mining Tools— Extract, Transform, Load (ETL)

Data Mining Tools—Relational Databases and SQL

Data Mining Tools—CRISP-DM

#### Data Storage and Security

Data Warehouses

Cloud Computing

Data Security

#### Artificial Intelligence

Types of Artificial Intelligence

Machine Learning and Deep Learning

Supervised and Unsupervised Learning

Natural Language Processing

#### Selecting and Implementing New Technology

Steps to Selecting New Technology

Total Cost of Ownership

Implementation Best Practices

Employee Skills

## Internet of Things

### Objectives:

- Explain what the internet of things (IoT) is, how it evolved, and how it can be used.
- Describe the need for and benefits of track and trace technology.
- Identify several types of technology needed for data capture, transmission, and access in IoT.
- Discuss what is needed for IoT infrastructure, including platforms and business application integration.
- Explain the concept of digital twins, why they are used, and their benefits and risks.
- Identify IoT applications in manufacturing and retail.
- Identify IoT challenges and possible actions to avoid these risks.

### Topics:

#### What Is the Internet of Things?

Defining IoT

Evolution of IoT

#### Visibility and the Need for Track and Trace

Supply Chain Visibility

What Is Track and Trace

Barcoding and QR Codes

Radio Frequency Identification (RFID)

Types of RFID

Not Just “Where Is My Package”—The Importance of IoT

IoT and Data Regulation

#### Technology Needed for IoT

The Cloud

Data Capture and Translations

Data Transmission

Data Access and Actionability

#### IoT Infrastructure

What Is an IoT Platform?

Enablement

Device and Software Management

Data Synchronization

Application Programming Interfaces (APIs)

Data Streaming

Event Management

Accessibility to IoT Data Feeds

Data Intelligence and Analytics

Big Data Sets

Edge Computing

## **Internet of Things (Continued)**

### **Digital Twins**

What Is a Digital Twin?

More than Just Sensor Data

Containerization

IT/OT Convergence

### **IOT and Business Segment Applications**

Integration of IoT into Business Sections

Shop Floor and Field Operations Visibility

Predictive Maintenance

Remote and Outsourced Operations

Retail

### **Challenges to Implementation**

Financial Impact

Cybersecurity

Data Sovereignty

# Cybersecurity

## Objectives:

- Explain the interrelationship of cybersecurity within an enterprise and within supply chain.
- Discuss the need for cybersecurity governance and the characteristics of a successful program.
- Describe essential tools and techniques for risk assessment, management, and mitigation.
- Describe the various levels of network access controls and monitoring methodologies.
- Discuss the concepts and purposes of redundancy, firewalls, and advanced anti-hacking technology.
- Explain why cybersecurity education is important at all levels within an organization.

## Topics:

### What Is Cybersecurity?

Evolution of Cybersecurity

Cybersecurity Inside the Organization

Cybersecurity—Who, What, Why, and How?

Cybersecurity in Supply Chain and Other Business Relationships

### Cybersecurity Governance

Why Have Cybersecurity Governance Programs?

What Should Cybersecurity Governance Programs Look Like?

Why Do Cybersecurity Governance Programs Fail?

### Cybersecurity Risk Assessment, Management, and Mitigation

Risk Assessment

Risk Management

System-Related Risk Mitigation

Non-System-Related Risk Mitigation

### Enterprise Cybersecurity Education

Employee Training

IT Education and Cybersecurity Training

Cybersecurity Risk Training across Supply Chain Partners

### Network Access Controls and Monitoring Methodologies

Network Access Control Solutions

Network Access Control—Employees

Network Access Control—Suppliers and Business Partners

Monitoring Methodologies

### Redundancy, Firewalls, and Anti-Hacking Technology

Redundancy and Methods to Achieve It

Firewalls

Anti-Hacking Technology



## Demand Planning Technologies

### Objectives:

- Explain demand planning and the importance of demand planning technologies in the supply chain.
- Describe the essential steps in forecasting demand.
- Explain how to select the correct forecasting method to predict demand.
- Describe the future of demand planning using technology as an enabler.
- Identify several types of forecasting errors and their sources.
- Recognize the role of demand planning in inventory management.

### Topics:

#### The Importance of Demand Planning Technologies in Supply Chain

What is Demand Planning?

Demand Planning Technologies

#### Essential Steps in Forecasting Demand

Steps in the Forecasting Process

Determining What to Forecast

Sources of Data for Forecasting

A Smartphone Accessory Retail Case Study

#### Forecasting Methods Used in Supply Chain

Types of Forecasting Methods

Judgmental Forecasting Method

Statistical Forecasting Method

Combination Forecasting Method

Choosing the Right Forecasting Method

#### The Future of Demand Planning

Elements of Demand Planning

Why is Demand Planning Important?

Methods of Demand Planning Using Technology

Machine Learning (ML) For Better Demand Predictions

Streamline Forecasting Processes with AI

Role of IoT in Demand Planning

Social Media and User-Generated Online Traffic Data

Time Series Forecasting: Use Cases

Technology Company Forecasting Problem

Traditional Planning versus Technology Planning

## **Demand Planning Technologies (Continued)**

### **Reliability of Forecasting**

Sources of Forecasting Errors and How to Reduce Them

Types of Errors

### **The Role of Demand Planning in Inventory Control**

How Demand Planning Fits within Inventory Control

Methods of Inventory Control

Strategies Used in Production Planning and Scheduling

Production Environments

## Additive Manufacturing (3D Printing)

### Objectives:

- Define additive manufacturing (AM) and explain its benefits.
- Discuss the key elements required for implementing AM, including various processes and the types of materials used.
- Describe how AM can benefit the supply chain.
- Discuss the challenges of implementing AM, including its limitations, as well as advantages and disadvantages of in-house versus outsourced AM.
- Describe situations in which a company should and should not use AM.

### Topics:

#### What Is Additive Manufacturing?

What Is Additive Manufacturing (3D Printing/Rapid Prototyping)?

The Additive Manufacturing Process

Hybrid Manufacturing

Benefits of Additive Manufacturing

#### Implementing Additive Manufacturing

Additive Manufacturing—Still an Emerging Technology

Various Types of Additive Manufacturing

Materials Used in Additive Manufacturing

#### Additive Manufacturing and Supply Chain

Prototypes

Inventory Implications

Distributed Manufacturing

Microfactories

Portability

Customization

Current Uses of Additive Manufacturing

Vision for Additive Manufacturing in the Future

#### Challenges of Implementing Additive Manufacturing

Limitations of 3D Printing Today

In-house versus Outsourcing

#### When to Use and When Not to Use 3D Printing

When Is 3D Printing the Right Choice?

When Is 3D Printing Not the Right Choice?

What to Expect in the Future

## About ASCM

The Association for Supply Chain Management (ASCM) is the global pacesetter of organizational transformation, talent development and supply chain innovation. As the largest association for supply chain, ASCM members and worldwide alliances fuel innovation and inspire accountability for resilient, dynamic and sustainable operations. ASCM is built on a foundation of world-class APICS education, certification and career resources, which encompass award-winning workforce development, relevant content, groundbreaking industry standards and a diverse community of professionals who are driven to create a better world through supply chain.

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