**Supply Chain Analytics**

**Introduction – Fall 2019**

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| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **Operations Management**  *“Transformation of Inputs to Outputs”* | | | | | | | |  | Inputs | → | Operations | → | Outputs |  | |  | | | | | | | | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **Supply Chain Management**  *“Management of Systems*  *between Supplier and Customer*  *that Satisfies Customer Demands”* | | | | | | | |  | Supplier | ↔ | Operations | ↔ | Customer |  | |  | | | | | | | |

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| **Supply Chain Management** | |  | **Value Chain Management** | |
| *Primary*  *Objective:* | Achieve Customer Order Fulfillment. |  | *Primary*  *Objective:* | Achieve Competitive Advantage. |
| *Secondary*  *Objective:* | High Service Level at a Low Cost. |  | *Secondary*  *Objective:* | Efficient Interrelated Systems. |

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| **Supply Chain Management**  *“Management of Systems between Supplier and Customer”*  **---------------Coordination---------------**  SRM = Supplier Relationship Management  OM = Operations Management  CRM = Customer Relationship Management | | | | | | |
|  | Supplier  SRM | ↔ | Operations  OM | ↔ | Customer  CRM |  |
| **-------------------------Integration-------------------------**  Logistics Management  Information Technology Management  Quality Management  Value Chain Management  Risk Management (Resiliency to Shocks) | | | | | | |

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| **Supply Chain Management.**  *“The design, implementation, and control of systems that manage the flow of information, material, money, knowledge, and services throughout the supply chain to continually increase quality, lower cost, and improve customer satisfaction.”* |

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| *Supply Chain Model:* | | | | | | | | |
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|  | Supplier | ▬ | Manufacturer | ▬ | Distributor | ▬ | Retailer |  |
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|  | SRM |  | S&OP, ERP, WMS |  | TMS |  | CRM |  |
|  | SRM = Supplier Relationship Management  S&OP = Sales & Operations Planning  ERP = Enterprise Resource Planning  WMS = Warehouse Management System  TMS = Transportation Management System  CRM = Customer Relationship Management | | | | | | |  |
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|  | Commodity Supply Chain | | |  |  |  |  |  |
|  |  | Global Supply Chain | | | | |  |  |
|  |  |  |  |  | Service Supply Chain | | |  |
|  |  |  | Reverse Supply Chain | | | | |  |
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|  | Supply Chain Management *to achieve* Order Fulfillment  Value Chain Management *to achieve* Competitive Advantage | | | | | | |  |
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|  | *Supply Chain Drivers*: Analytics, Globalization, Sustainability | | | | | | |  |
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| *Supply Chain Industry:* | | | | | | |  |
|  |  | *Supply Chain Initiatives* | | | | |  |
|  |  | Lean  (Cost,Waste) | Green  (TBL,CSR) | Resilient  (Risk) | Responsive  (Efficiency) | Smart  (Technology) |  |
| *Key Supply Chains* | Commodity  Supply Chain |  |  |  |  |  |  |
| Global  Supply Chain |  |  |  |  |  |  |
| Service  Supply Chain |  |  |  |  |  |  |
| Reverse  Supply Chain |  |  |  |  |  |  |
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|  | *Functions* | Inventory | Logistics | Relationships | Information | Strategy |  |
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| *Supply Chain Model:* | | | | | | | | |
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|  | Supplier | ▬ | Manufacturer | ▬ | Distributor | ▬ | Retailer |  |
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|  | SRM |  | S&OP,ERP,WMS |  | TMS |  | CRM |  |
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|  | SRM = Supplier Relationship Management | | | | | | |  |
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|  | S&OP = Sales & Operations Planning | | | | | | |  |
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|  | ERP = Enterprise Resource Planning | | | | | | |  |
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|  | WMS = Warehouse Management System | | | | | | |  |
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|  | TMS = Transportation Management System | | | | | | |  |
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|  | CRM = Customer Relationship Management | | | | | | |  |
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| *Supply Chain Model:* | | | | | | | | |
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|  | Supplier | ▬ | Manufacturer | ▬ | Distributor | ▬ | Retailer |  |
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|  | SRM |  | S&OP,ERP,WMS |  | TMS |  | CRM |  |
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|  | Commodity Supply Chain | | |  |  |  |  |  |
|  |  | Global Supply Chain | | | | |  |  |
|  |  |  |  |  | Service Supply Chain | | |  |
|  |  |  | Reverse Supply Chain | | | | |  |
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|  | Commodity Supply Chain. A supply chain that extracts and supplies commodities to satisfy downstream requirements or transforms commodities into other commodities. | | | | | | |  |
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|  | Global Supply Chain. A supply chain that spans international boundaries. | | | | | | |  |
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|  | Service Supply Chain. A supply chain that provides services to support a physical supply chain or a supply chain that provides services to meet external customer demand for services. | | | | | | |  |
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|  | Reverse Supply Chain. A supply chain where physical goods travel upstream. | | | | | | |  |
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| *Supply Chain Model:* | | | | | | | | |
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|  | Supplier | ▬ | Manufacturer | ▬ | Distributor | ▬ | Retailer |  |
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|  | SRM |  | S&OP,ERP,WMS |  | TMS |  | CRM |  |
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|  | Commodity Supply Chain | | |  |  |  |  |  |
|  |  | Global Supply Chain | | | | |  |  |
|  |  |  |  |  | Service Supply Chain | | |  |
|  |  |  | Reverse Supply Chain | | | | |  |
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|  | Supply Chain Management *to achieve* Order Fulfillment  Value Chain Management *to achieve* Competitive Advantage | | | | | | |  |
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|  | Supply Chain Management *to achieve* Order Fulfillment  (Physical – Measurable – Definable)  (Macro-focused) | | | | | | |  |
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|  | Value Chain Management *to achieve* Competitive Advantage  (Relative – Descriptive – Conceptual)  (Micro-focused) | | | | | | |  |
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| *Supply Chain Model:* | | | | | | | | |
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|  | Supplier | ▬ | Manufacturer | ▬ | Distributor | ▬ | Retailer |  |
|  |  |  |  |  |  |  |  |  |
|  | SRM |  | S&OP,ERP,WMS |  | TMS |  | CRM |  |
|  |  |  |  |  |  |  |  |  |
|  | Commodity Supply Chain | | |  |  |  |  |  |
|  |  | Global Supply Chain | | | | |  |  |
|  |  |  |  |  | Service Supply Chain | | |  |
|  |  |  | Reverse Supply Chain | | | | |  |
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|  | Supply Chain Management *to achieve* Order Fulfillment  Value Chain Management *to achieve* Competitive Advantage | | | | | | |  |
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|  | *Supply Chain Drivers*: Analytics, Globalization, Sustainability | | | | | | |  |
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|  | Analytics.  Big Data: Descriptive, Predictive, Prescriptive, Advanced, Modeling, AI.  IoT, Cloud computing, Virtual reality, Augmented reality, Intelligent operations. | | | | | | |  |
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|  | Globalization.  Access and Opportunity: Transportation, Communication.  Capability and Potential: Resources, Economics, Markets. | | | | | | |  |
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|  | Sustainability.  TBL. Triple Bottom Line: Economic (Profit) Sustainability, Environmental (Planet) Sustainability, Sociopolitical (People) Sustainability.  CSR. Corporate Social Responsibility: Policy and practice of an organization based on ethical behavior. | | | | | | |  |
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| *Supply Chain Industry:* | | | | | | |  |
|  |  | *Supply Chain Initiatives* | | | | |  |
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| *Key Supply Chains* | Commodity  Supply Chain |  |  |  |  |  |  |
| Global  Supply Chain |  |  |  |  |  |  |
| Service  Supply Chain |  |  |  |  |  |  |
| Reverse  Supply Chain |  |  |  |  |  |  |
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|  | *Functions* | Inventory | Logistics | Relationships | Information | Strategy |  |
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| *Supply Chain Initiatives* |
| Lean Supply Chain. An efficient supply chain with a focus on reducing cost by eliminating waste throughout the supply chain. | |
| Green Supply Chain. A supply chain with sustainability standards throughout the supply chain based on sustainable strategy, development, and planning. | |
| Resilient Supply Chain. A supply chain that mitigates risks through preparation, responding, and recovering from disruptive supply chain events or threats. | |
| Responsive Supply Chain. An agile supply chain that responds to changes in the marketplace through achieving and maintaining target service levels in a timely manner. | |
| Smart Supply Chain. A supply chain that capitalizes on the use of technology and analytics. | |

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| *Key Supply Chains* |
| Commodity Supply Chain. A supply chain that extracts and supplies commodities to satisfy downstream requirements or transforms commodities into other commodities. | |
| Global Supply Chain. A supply chain that spans international boundaries. | |
| Service Supply Chain. A supply chain that provides services to support a physical supply chain or a supply chain that provides services to meet external customer demand for services. | |
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| Service  Supply Chain |  |  |  |  |  |  |
| Reverse  Supply Chain |  |  |  |  |  |  |
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| **Supply Chain Functions**  *Coordination of Service Level & Cost*   |  |  |  | | --- | --- | --- | | **Inventory** | **Logistics** | **Relationships** | | Echelon Inventory  Forecasting  Risk Pooling | Network Configurations  Transportation  Cross-Docking | Procurement  Outsourcing  Alliances |  |  |  | | --- | --- | | **Information** | **Strategy** | | Communication  Analysis  Bullwhip Effect | PUSH-PULL Strategies  Standardization  Delayed Differentiation |  |  | | --- | | **SCOR Model: Supply Chain Operations Reference Model** |   . . . |

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|  | *Brief Course Summary* | |  |  |  |  |  |
|  | *Topic* | *Subject* |  | *Resources* |  | *Emphasis* |  |
|  | 1 | Inventory |  | Chapter 2 |  | Forecasting & Risk Pooling |  |
|  | 2 | Logistics |  | Chapter 3,7 |  | Location & Networks |  |
|  | 3 | Relationships |  | Chapter 8,9 |  | Alliances & Outsourcing |  |
|  | 4 | Information |  | Chapter 5,14 |  | Infrastructure & Bullwhip Effect |  |
|  | 5 | Strategy |  | Chapter 6,11,12,13 |  | PUSH-PULL & Design |  |
|  | 6 | Commodity Supply Chains |  |  |  | Definition & Design & Characteristics |  |
|  | 7 | Global Supply Chains |  |  |  | Definition & Design & Characteristics |  |
|  | 8 | Service Supply Chains |  |  |  | Definition & Design & Characteristics |  |
|  | 9 | Reverse Supply Chains |  |  |  | Definition & Design & Characteristics |  |
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**Supply Chain Management (SCM): References**

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| **Inventory Management**  Website: “[www.apics.org](http://www.apics.org)” The Association for Operations Management.  (Certifications: CSCP, CPIM, CIRM)  Book: Vollmann, T.E., W.L. Berry, D.C. Whybark, F.R. Jacobs, *Manufacturing Planning and Control for Supply Chain Management*, McGraw-Hill/Irwin, New York, 2005. ISBN-13 9780072299908 |
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| **Demand Management**  Greenberg, P., *CRM at the Speed of Light, Third Edition: Essential Customer Strategies for the 21st Century*, McGraw-Hill/Irwin, New York, 2004.  ISBN-13 9780072231731 |

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| ***Other Related Websites***  \*Project Management Institute. Website: “[www.pmi.org](http://www.pmi.org)”  \*American Society for Quality. Website: “[www.asq.org](http://www.asq.org)”  \*Institute for Operations Research and the Management Sciences.  Website: “[www.informs.org](http://www.informs.org)”  \*American Statistical Association. Website: “[www.amstat.org](http://www.amstat.org)”  \*Supply Chain Council, SCOR. Website: “[www.supply-chain.org](http://www.supply-chain.org)”  \*International Association for Six Sigma Certifications.  Website: “<http://www.iassc.org/>”  \*International Association of Outsourcing Professionals.  Website: “<http://www.iaop.org/content/23/193/1268/>” |