**Supply Chain Analytics**

**Introduction – Fall 2019**

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| **Operations Management***“Transformation of Inputs to Outputs”* |
|  | Inputs | → | Operations | → | Outputs |  |
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| **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 ManagementOM = Operations ManagementCRM = Customer Relationship Management |
|  | SupplierSRM | ↔ | OperationsOM | ↔ | CustomerCRM |  |
| **-------------------------Integration-------------------------**Logistics ManagementInformation Technology Management Quality ManagementValue Chain ManagementRisk 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:* |
|  |  |  |  |  |  |  |  |  |
|  | Supplier | ▬ | Manufacturer | ▬ | Distributor | ▬ | Retailer |  |
|  |  |  |  |  |  |  |  |  |
|  | SRM |  | S&OP, ERP, WMS |  | TMS |  | CRM |  |
|  | SRM = Supplier Relationship ManagementS&OP = Sales & Operations PlanningERP = Enterprise Resource PlanningWMS = Warehouse Management SystemTMS = Transportation Management SystemCRM = Customer Relationship Management |  |
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|  | Commodity Supply Chain |  |  |  |  |  |
|  |  | Global Supply Chain |  |  |
|  |  |  |  |  | Service Supply Chain |  |
|  |  |  | Reverse Supply Chain |  |
|  |  |  |  |  |  |  |  |  |
|  | 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  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  | *Functions* | Inventory | Logistics | Relationships | Information | Strategy |  |
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| *Supply Chain Model:* |
|  |  |  |  |  |  |  |  |  |
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|  | SRM |  | S&OP,ERP,WMS |  | TMS |  | CRM |  |
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|  |  |  |  |  |  |  |  |  |
|  | 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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|  |  | Global Supply Chain |  |  |
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|  |  |  | 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 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 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 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* |
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| **Supply Chain Functions***Coordination of Service Level & Cost*

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| **Inventory** | **Logistics** | **Relationships** |
| Echelon InventoryForecastingRisk Pooling | Network ConfigurationsTransportationCross-Docking | ProcurementOutsourcingAlliances |

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| **Information** | **Strategy** |
| CommunicationAnalysisBullwhip Effect | PUSH-PULL StrategiesStandardizationDelayed Differentiation |

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| **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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| **Supply Management** Website: “[www.ism.ws](http://www.ism.ws)” Institute for Supply Management (Certifications: CPSM, CPM, APP)Book: Burt, D.N., D.W. Dobler, S.L. Starling, *World Class Supply Management: The Key to Supply Chain Management*, McGraw-Hill/Irwin, New York, 2003. ISBN-13 9780072831566 |
| **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 |
| **Logistics Management**Website: “[www.cscmp.org](http://www.cscmp.org)” Council of Supply Chain Management ProfessionalsBook: Bowersox, D.J., D.J. Closs, M.B. Cooper, *Supply Chain Logistics Management*, McGraw-Hill/Irwin, New York, 2007. ISBN-13 9780072947885 |
| **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/>”  |