***Supply Chain Management – Information Technology***

Summary for Supply Chain Management

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| **Information**. From Simchi-Levi Text, Chapters 5,14 | |
| \*Bullwhip Effect. | \*Bullwhip Effect.  -The Bullwhip Effect is when the Demand Variability Increases Upstream in a Supply Chain  -Results (5) Identify 5 Results of the B-E  -Causes (5) Identify 3 Causes of the B-E  -Approaches (5) Identify 5 Approaches of the B-E  -Trade-offs (4) Identify 4 Trade-offs of the B-E  -Management (3) Identify 3 Management of the B-E |
| \*BPS & IS & SCOR  \*SCIT  -Collect & Access  -Analyze & Collaborate  \*Components  -Network design  -Tactical planning  -Operational planning  -Operational execution | \*BPS & IS & SCOR  BPS(Business Process Systems)  & IS(Information Systems)  & SCOR(Supply Chain Reference)  -For Supply Chain efficiency,  do not develop Information System maturity  ahead of Business Process maturity  \*SCIT. Supply Chain Information Technology  -Collect & Access part of an ERP systems  Analyze & Collaborate accomplished by data analysis and analytics within DSS and APS  \*Components  -Network design. Strategic, long-term planning.  -Tactical planning. Aggregate planning.  -Operational planning. Short-term local planning.  -Operational execution. Daily procedures. |

***Supply Chain Management – Information Technology***

**Business Process Systems Correlated with Information Systems**

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| Reference: Heinrich, C.D., and D. Simchi-Levi. “Do IT Investments Really Change Financial Performance?” *Supply Chain Management Review*, May 2005, pp.22-28. |

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|  | Business Process Systems (BPS)  Level I. Disconnected processes  Level II. Internal integration  Level III. Intra-company integration  Level IV. Multi-enterprise integration  . | |  | Information Systems (IS)  Level I. Independent, redundant systems  Level II. Shared across systems  Level III. Internally visible data  Level IV. Internally/externally shared data  . | |  |
|  |  | 🡺 | 🡺 | 🡺 |  |  |
|  |  | SCOR Evaluation of Planning Areas  1. Strategic planning  2. Demand planning  3. Supply planning  4. Supply-demand balancing  5. Procurement planning  6. Manufacturing planning  7. Delivery planning  . | | |  |  |
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Results of evaluations on 75 supply chains in companies with different combination of

business process systems maturity and information systems maturity.

*“Maturity is defined as immature to mature as levels proceed from I to IV.”*

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|  | Supply Chain | | | Information System (IS) | | | |  |
|  | Performance | | | Level I | Level II | Level III | Level IV |  |
|  |  |  |  | *Immature* | | *Mature* | |  |
|  | Business Process System (BPS) | Level I | *Immature* | **A**  Low performance | | **D**  Worst performance | |  |
|  | Level II |  |
|  | Level III | *Mature* | **B**  Better performance | | **C**  Best performance | |  |
|  | Level IV |  |
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Ordinal relationship based on efficiency and profitability

from least efficient to most efficient

is reported to be D🡪A🡪B🡪C

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| *For Supply Chain efficiency,*  *do not develop Information System maturity*  *ahead of Business Process maturity* |

***Supply Chain Management (SCM): Information Technology***

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| Supply Chain Information Technology | 🡪 | *enables* | 🡪 | Supply Chain Management |
| (SCIT) |  | 🡪 |  | (SCM) |

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| SCIT Goals: |  | Collect | 🡪 | Access | 🡪 | Analyze | 🡪 | Collaborate |  |  |
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| SCIT 🡪 |  | ERP | | | 🡪 | DSS | | | 🡪 | SCM |
|  |  | (ERPII) | | |  | (APS) | | |  |  |

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|  |  | ***DSS Structure*** |  |  |
|  |  | Data Analysis  System Modeling |  |  |
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| **Input** | **🡪** | **Analytical Tools** | **🡪** | **Presentation Tools** |
|  |  |  |  |  |
| ERP |  | Data Warehouses |  | Reports & Tables |
| SRM |  | OLAP |  | Data Visualization |
| CRM |  |  |  | Simulations/Animations |
| SCM |  | Data Mining |  | GIS |
|  |  | Statistics |  |  |
| Data Bases |  |  |  |  |
| OLTP |  | Operations Research |  |  |
| Data marts |  | Simulation |  |  |
|  |  | AI/ES |  |  |

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|  | **Data**  **Base** |  | **Data**  **Warehouse** |  | **Data**  **Mart** |  |
|  | Defined  Sources |  | Multiple  Sources |  | Focused  Subset |  |
|  | General  Scope |  | Enterprise  Scope |  | Focused  Scope |  |
|  | OLTP  Online Transaction  Processing |  | OLAP  Online Analytical  Processing |  | User  Interface |  |
|  | Defined  processes |  | Complex  queries |  | Repeatable  applications |  |
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**Supply Chain System Components**

1. Strategic – Network design (Long-term)

2. Tactical Planning – Supply chain master planning

3. Operational Planning – Operational planning (Short-term, Local)

4. Operational Execution – Transactional (Daily Procedures)

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|  |  |  |  | **Supply Chain System Components** |  |
|  | 1. Strategic – Network design (Long-term) | | | |  |
|  |  | 2. Tactical Planning – Supply chain master planning  (Aggregate planning for PUSH-based supply chain.)   |  |  |  | | --- | --- | --- | | Production | Integrate | Production Plans / (source) | | Transportation | Storage Requirements / (capacity) | | Inventory | Inventory Policies / (distribution) |   . | | |  |
|  |  |  | 3. Operational Planning – Operational planning (Short-term, Local)  (Integrate system plans with master plan. Application of CPFR.)   * 1. Demand (e.g., forecasting)   2. Inventory (e.g., inventory policy, safety stock)   3. Transportation (e.g., mode selection, routing)   4. Production (e.g., schedules)   5. MRP (starting point)   . | |  |
|  |  |  |  | 4. Operational Execution – Transactional (Daily Procedures)  (ERP, CRM, SRM, SCM, event management.)   * 1. ATP: Available to promise   2. CTP: Capable to promise   3. PTP: Profitable to promise   . |  |
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| ERP 🡸🡺DSS | | | |
| SCIT Implementation: | Sole-source | “Best-of-breed” | Combination |
| SCIT  Selection Factors: | 1.  2.  3. | 1.  2.  3. | 1.  2.  3. |

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| Sales & Operation Planning (S&OP) – Integration.  (Integrate supply chain system components to satisfy supply chain strategy.) |