What We Can Learn from The Supply Chain

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March 20, 2019

Supply chain management

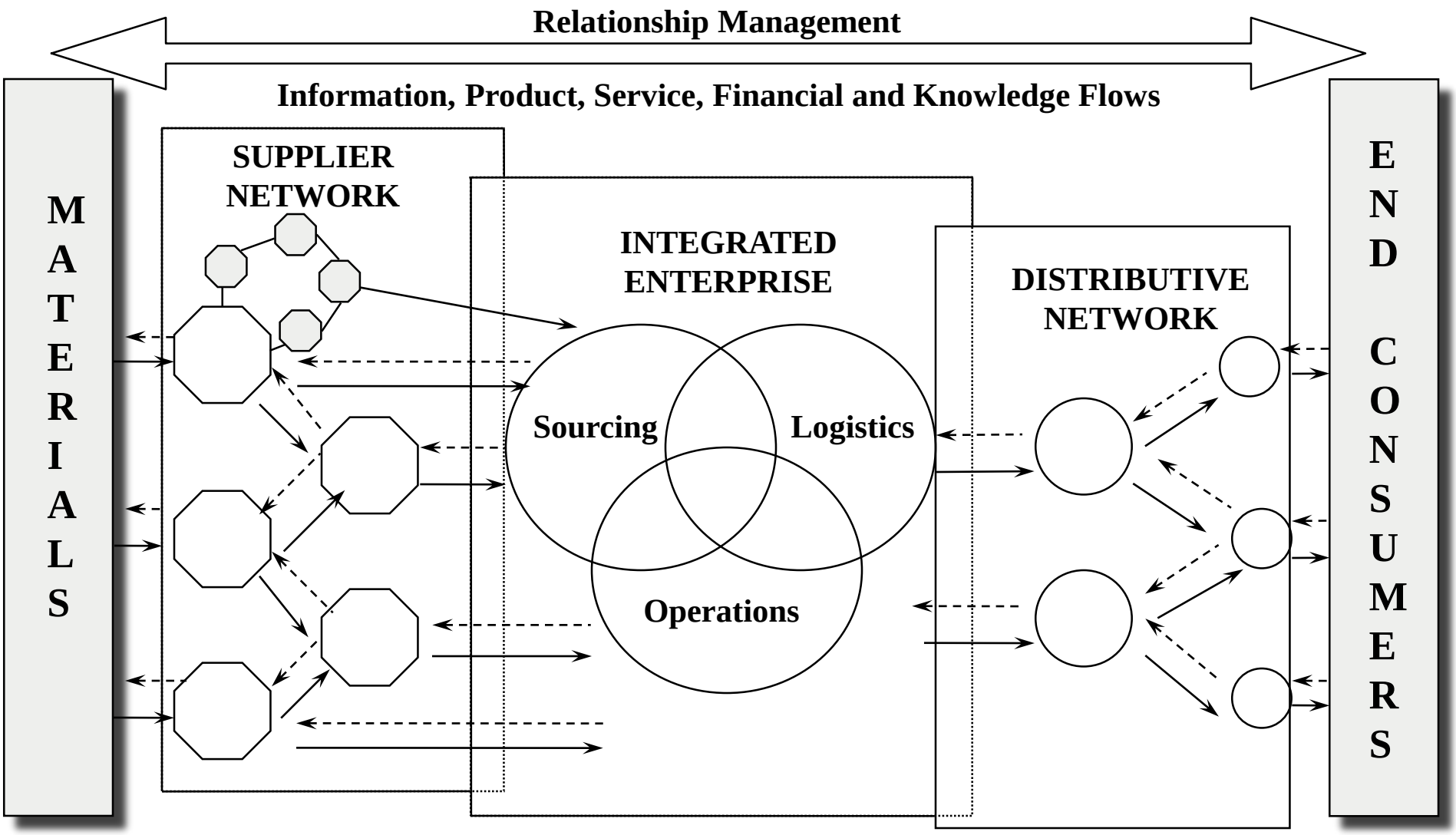
- **Ways to view SCM: Stages**



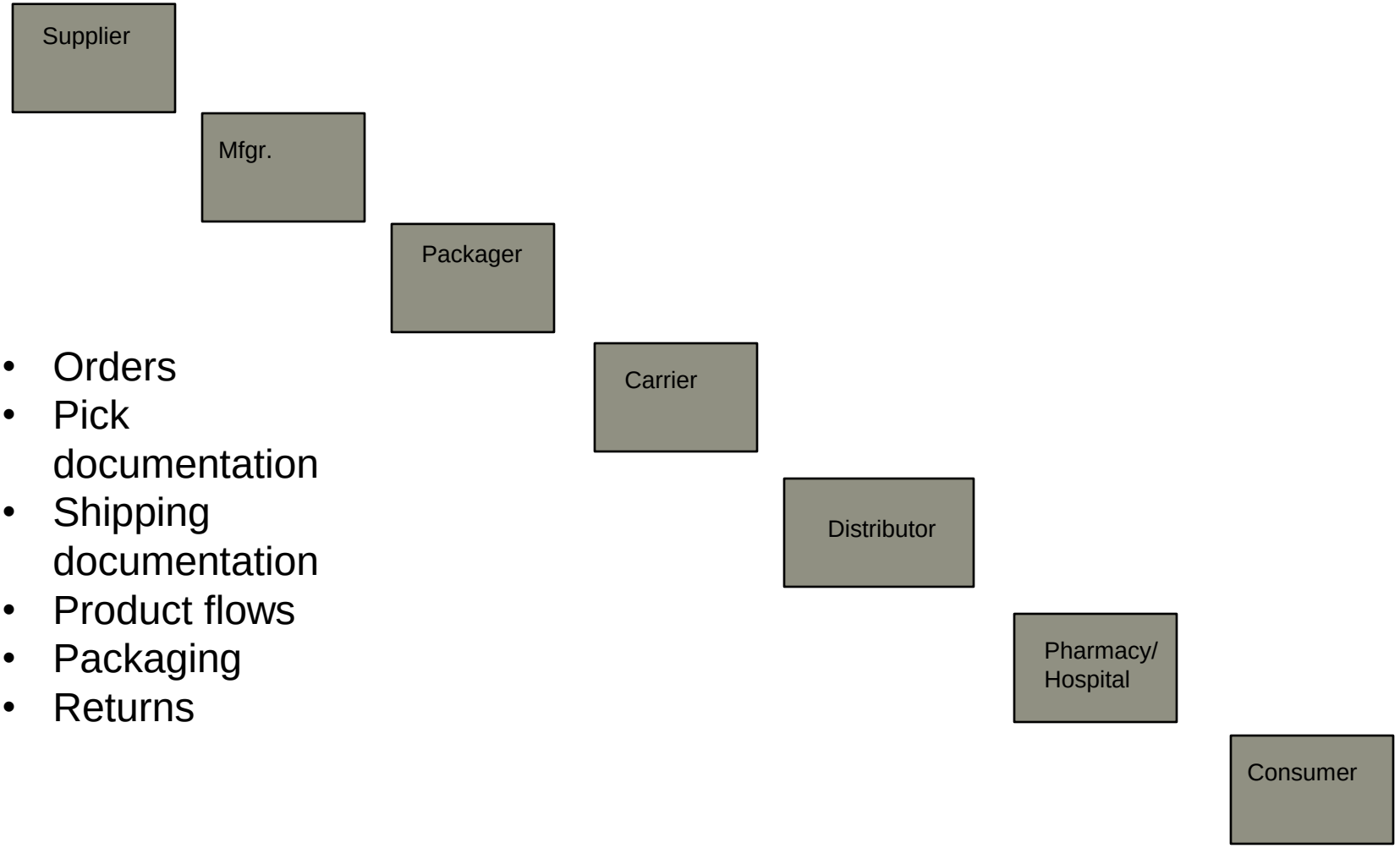


Supplier → **Manufac.** → **Wholesaler** → **Retailer** → **Consumer**

THE INTEGRATED SUPPLY CHAIN



Entities in the Blockchain



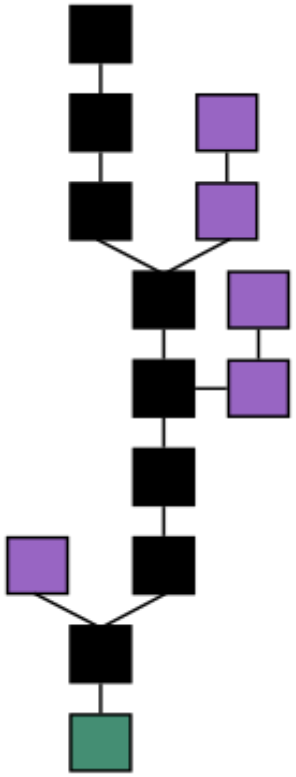
- Orders
- Pick documentation
- Shipping documentation
- Product flows
- Packaging
- Returns

What is Blockchain?

- An immutable, secure, shared version of the truth….
  - Shared, append-only ledger
  - Private and permissioned
  - Trust through consensus
  - Smart contract governance

BlockChain Technology

- Supply Chain
  - Order tracking
  - Compliance
  - Security
  - Counterfeiting
  - International trade
  - Transit monitoring



Blockchain Methods

- Blockchain is a distributed database that maintains digital transactions or events that makes them tamper-resistant.
- Cross-organizational (suppliers, manufacturers, distributers, retailers, and logistics service providers) to access, inspect, or add to the data.
- Think of it like this: If the entire blockchain were the history of customer or replenishment orders, and individual order would be a single “block” in the chain. Unlike most supply chains, however, there is no single organization (supplier, manufacturer, distributor, retailer, or logistics service provider) that controls these transactions. Once the “block” is loaded into the blockchain, it cannot be changed by any party making it much easier and safer for the supply chain to monitor and track transaction across the Internet.

How Can Blockchain Drive Value for Supply Chain?

- An immutable, secure, shared version of the truth
- Shared, append-only ledger
- Private and permissioned
- Trust through consensus
- Smart contract governance
- Traceability and safety of food and pharmaceuticals
- Efficient and secure global trade
- B2B transaction tracking in supply chain management

Helping Build a Smarter Supply Chain

- Ensuring truly frictionless supply chains and value chains
- Being best-in-class in delivering visibility and disruption management
- Putting fulfillment at the heart of the customer experience

Blockchain Introduction

- Facilitates secure communication between financial and supply chain institutions.
- Increases data integrity, accuracy, and security between supply chain partners.
- Applies to situations involving
  - Sources of materials
  - Manufacturers
  - Production
  - Distributors
  - Hospitals
  - Pharmacies

Blockchain Applications

- Risks
  - Counterfeiting
  - Raw material falsification
  - Theft for resale
- Examples
  - High value branded goods
  - Repair parts for durable items
  - Health care supplies
  - Alcohol
  - Pharmaceuticals

Blockchain Applications

- Pharmaceutical industry is one of the most impacted by counterfeiting.
  - High value
  - Relative ease of falsifying raw material
  - Gray market manufacturers and distributers
- Passage of the Drug Supply Chain Security Act (DSCSA) in the US and the passage of similar acts in many countries around the world.
  - Requires that raw materials, finished goods, and packaging be tracked from the initiation of the manufacturing process through to the retailer or institution that transfers the product to the patient.

Blockchain Applications

- Specifically, blockchain technology can improve supply chain operations by:
  - Recording the quantity and transfer of assets – like pallets, trailers, containers, etc. – as they move between supply chain nodes.
  - Track purchase orders, change orders, receipts, shipment notification, or other trade-related documents.
  - Assign or verify certifications or certain properties of physical products.
  - Link physical goods to serial number, bar codes, digital tags like RFID.
  - Share information about the manufacturing process, assembly, delivery, and maintenance of products with suppliers and vendors.

Blockchain Benefits

- Security
  - Tracking
  - Visibility
  - Transparency
- Operational
  - Reduced time delay
  - Reduced cost
  - Reduced human error
  - Greater scalability
  - Usage tracking