SUPPLY CHAIN SUSTAINABILITY

Sustainability in Supply Chain Management

Definitions:

Supply chain management encompasses all activities associated with the flow and transformation of goods from the raw materials stage through the end user, as well as the associated information flows. (*CSCPM*)

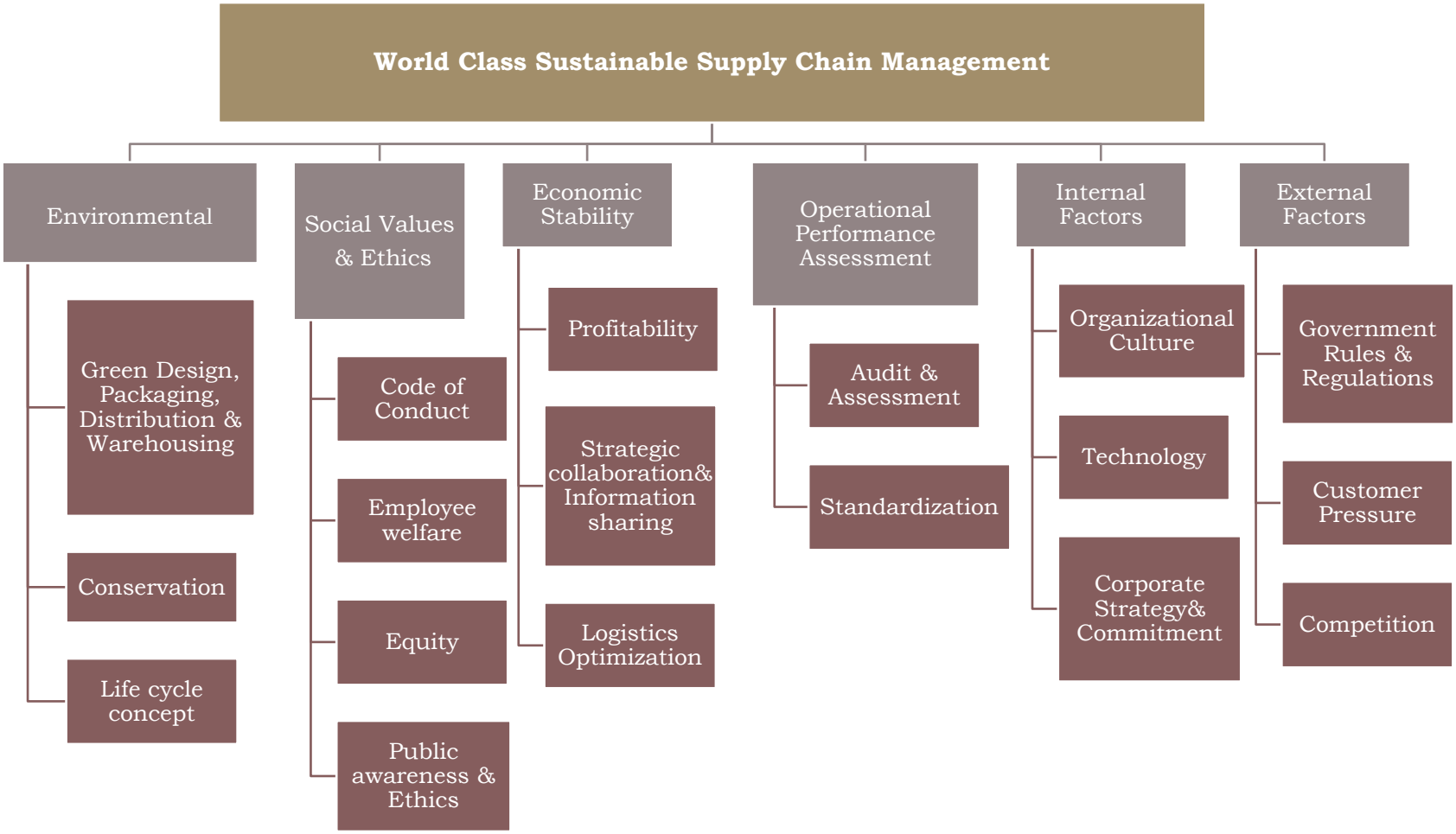
Sustainable supply chain management requires that sustainability criteria be met while maintaining competitiveness through meeting customer needs. (*Seuring and Müller, 2008*)

Sustainability in Supply Chain Management

Supply chains are boundary spanning

- Coordination across normal boundaries means that many aspects of sustainability may be affected
- From initial processing of RM to consumption by final customer

World Class Sustainable Supply Chain Management



Source: Reefke and Sundaram, 2016

Supply Chain Sustainability Framework

- Sustainability practices promote harmony between the industrial system and nature.
- The top sustainability priority is to reduce carbon footprint

Supply Chain Sustainability Framework

- Green SCM means green purchasing, mfg., distribution, and reverse logistics.
- Sustainability integrates three Ps (profit, people, and planet).
- Sustainability considers the entire life cycle of the products in the SCM including product design, material sourcing, mfg., delivery, operations, and disposal.
- Sustainable means "do no harm to the natural and social systems, while still making a profit over an extended period of time.
- Sustainable market framework:
  - Reduce surplus supply in the SC (no over production)
  - Reduce reverse supply (reparable, recyclable, re-mfg., etc)

Sustainability Approaches

- Re-use
- Re-manufacturing
- Re-conditioning
- Recycling

Why Should Supply Chains Try to Be Sustainable?

- Reduce cost and wastes
- Manage risks
- Create distinguishing (sellable) reputation
- Reinforce shareholder value

Reverse Logistics Systems

- Reverse flows are goods and materials moving upstream in the supply chain.
- Reverse flows were traditionally ignored, but regulation and economics have increased attention on them.
- Traditionally, reverse flows were not viewed as adding value for customers or revenue for the manufacturer or producer.
- Information and financials (cash) are important dimensions of reverse logistics and closed loop supply chains.
- Global supply chains present challenges and opportunities for reverse flows Including green laws.

Importance and Magnitude of Reverse Flows

- Estimates are that returns range from 3 – 50% depending on the product.
- Retailers lose 3 to 5% of gross sales to returns, accounting for about 4.5% of the cost of logistics.
- Internet returns are about double the counter sale returns.

Importance and Magnitude of Reverse Flows

- Eight categories of reverse flows

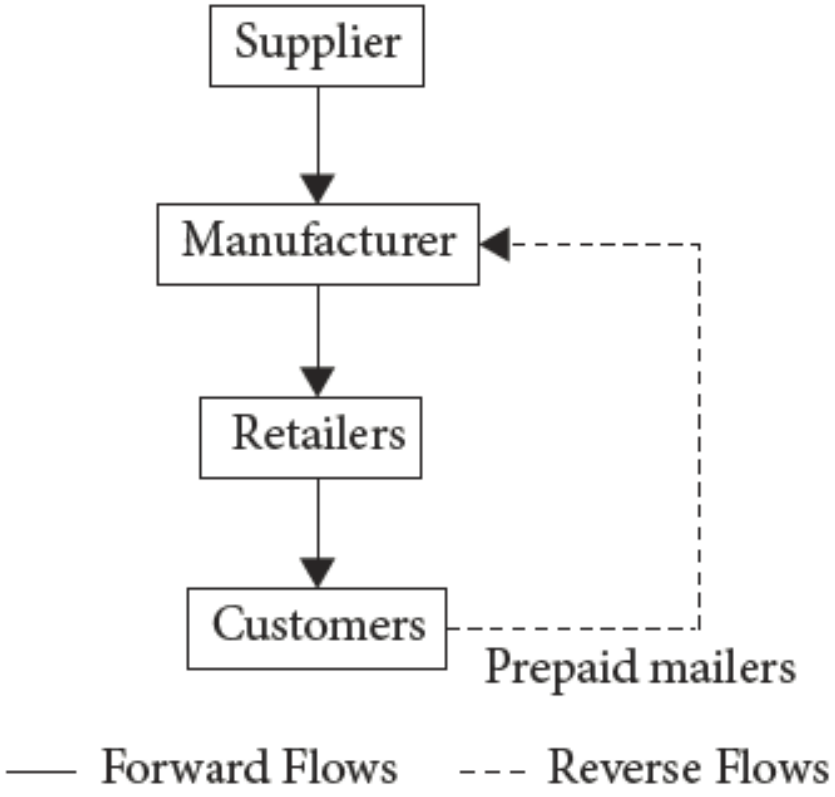
1. Products that have failed; are unwanted, damaged, or defective; but can be repaired or remanufactured and resold.
2. Products that are old, obsolete, or near the end of their shelf life but still have some value for salvage or resale.
3. Products that are unsold from retailers, usually referred to as overstocks that have resale value.
4. Products being recalled due to a safety or quality defect that may be repaired or salvaged.
5. Products needing "pull and replace" repair before being put back in service.
6. Products that can be recycled such as pallets, containers, computer inkjet cartridges, etc.
7. Products or parts that can be remanufactured and resold.
8. Scrap metal that can be recovered and used as a raw material for further manufacturing.

Reverse vs. Closed-Loop Logistics Systems

- Reverse logistics—The process of moving or transporting goods from their final destination for the purpose of capturing value or for proper disposal.
  - Reserve logistics involves the processes for sending new or used products "back up stream" for repair, reuse, refurbishing, resale, recycling, or scrap/salvage.

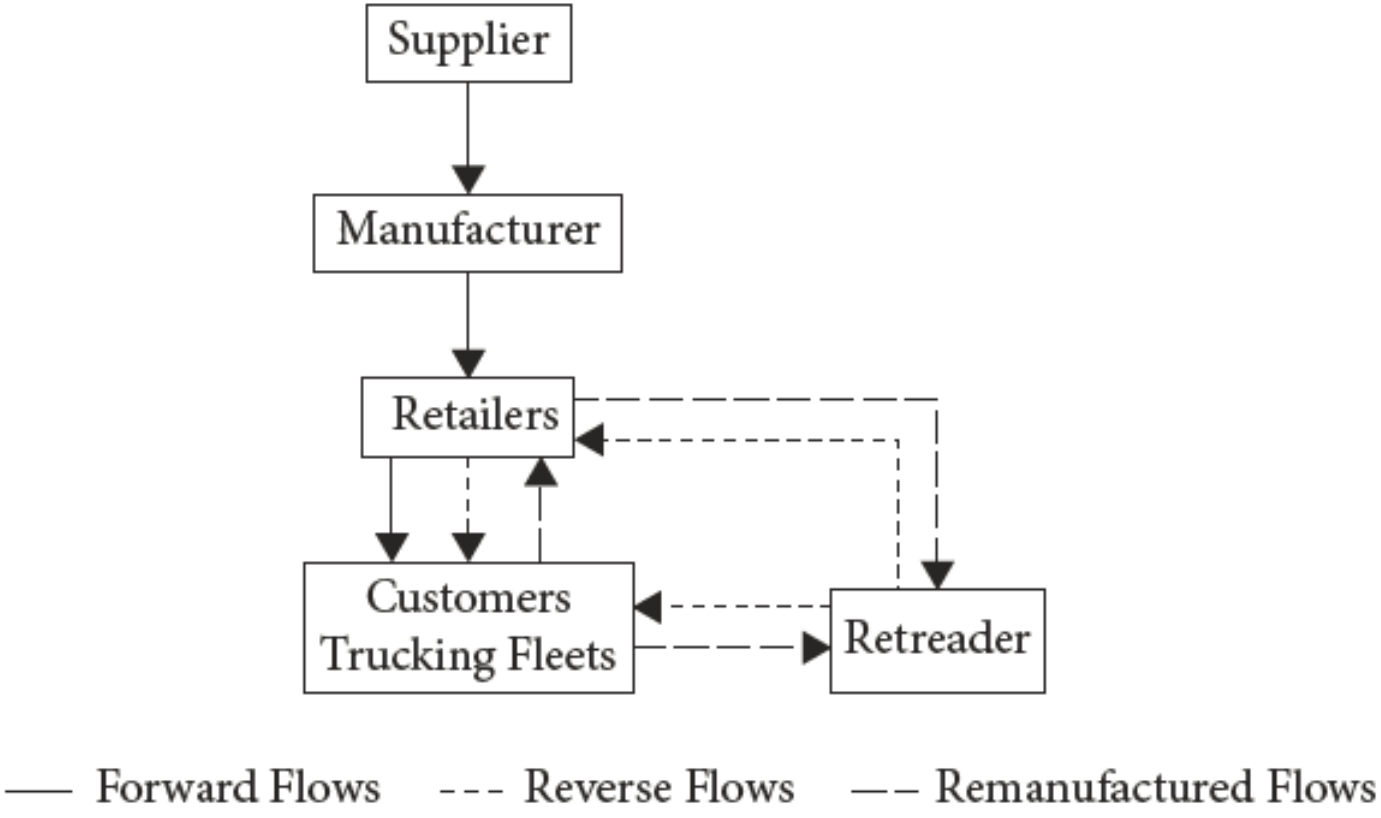
- Closed loop supply chains—Designed and managed to explicitly consider both forward and reverse flows activities in a supply chain.
  - Explicitly designed and managed for both flows

Closed Loop Supply Chain for Cartridges



Source: Center for Supply Chain Research, Penn State University.

Closed Loop Supply Chain for Tire Retreading



Source: Center for Supply Chain Research, Penn State University.

Reverse vs. Closed-Loop Logistics Systems

- Customer Returns

  A variety of reasons for customer returns can be given (as indicated previously) including defective or unwanted items, warranty problems, recalls, and miss-shipments.

- Environmental Challenges

  Recycling and environmental concerns are frequently viewed simultaneously because of their association with regulatory policy at the local, state, and/or federal level.

Reverse vs. Closed-Loop Logistics Systems

- Economic Value
  - Value has become an important for businesses and even some nonprofit organizations.
- Making reverse flows profitable is a challenge as well as an opportunity.

Achieving a Value Stream for Reverse Flows

Barriers to implementing a reverse flows system (which could be internal or external):

- Lack of "buy-in" from top level management in the organization
- Priority relative to other issues and potential projects or programs in the organization
- Financial resources necessary for operations and asset infrastructure
- Personnel resources required to develop and implement the reverse flows program
- Adequacy of material and information systems to support the returns program

Managing Reverse Flows in a Supply Chain

Recommendation by the Reverse Logistics Educational Council:

- **Avoidance**—Producing high-quality products and developing processes to minimize or eliminate returns
- **Gatekeeping**—Checking and screening merchandise at the entry point into the reverse flows process to eliminate unnecessary returns or minimize handling
- **Reducing reverse cycle times**—Analyzing processes to enable and facilitate compression of time for returns to enhance value recapture
- **Information systems**—Developing effective information systems to improve product visibility, reduce uncertainty, and maximize economies of scale.
- **Returns centers**—Developing optimum locations and facility layouts for returns centers to facilitate network flow

Managing Reverse Flows in a Supply Chain

Recommendations by the Reverse Logistics Educational Council:

- **Asset recovery**—Classifying and disposing of returned items, surplus, scrap, and obsolete items to maximize returns and minimize cost
- **Pricing**—Negotiating the best price for products being returned and resold
- **Outsourcing**—Considering a relationship with a third-party organization to handle and manage reverse flows in cases where existing personnel, infrastructure, experience, and/or capital may not be adequate to implement a successful program
- **Zero returns**—Developing a policy to exclude returns by giving a returns allowance and/or "destroying" the product in the field
- **Financial management**—Developing guidelines and financial procedures to properly account for charges against sales and related financial issues when items are returned by customers

Summary

1. Sustainability has become an increasingly important objective for private-sector for-profit organizations in the twenty-first century.
2. Initially organizations focused upon sustainability because of political and public pressure and their recognition of the importance of their social responsibility.
3. In recent years there has been a growing recognition of the economic opportunity to reduce cost and improve profit positions.
4. Sustainability is a challenging and complex issue because of the diversity of views on the topic, but some supply chain professionals have found it useful to consider sustainability on a broad functional basis—inbound functions, production and operation functions, and outbound or distribution functions.

Summary

5. Transportation is frequently a critical part of a sustainability effort since it has the potential of leaving such a large carbon footprint. Various transportation strategies that are both cost efficient and ecologically sound can be used to mitigate this challenge.
6. The so-called R's of sustainability include: reuse, remanufacturing, refurbishing, and recycling. The R's are unique but can be used in a comprehensive program where they are complimentary to each other.
7. The R's can be an important component of a recycling program to create a value stream for the organization to enhance profitability.
8. Recycling is often part of a reverse flow logistics system or closed-loop logistics system, and both have grown in importance as reverse flow volumes have increased during the last two decades.

Summary

9. The major forces impacting the growth in reverse flow volumes have been customer returns, environmental policies, and economic benefits for organizations.
10. When designing an efficient and effective returns flow program, consideration must be given to the variety of the returns and the development of procedures and processes for each one.
11. An analysis of the benefits of a reverse or return flows program is dependent upon the development of the true costs associated with such a program and comparing them to a realistic measure of the benefits.


Terima Kasih
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danke
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ngiyabonga
spas
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