SCONTO: A Supply Chain ONTOlogy that extends and formalizes the SCOR model

Motivation

Supply chains characteristics:

- Increasingly competitive, complex and dynamic
- Multiple actors (manufacturers, suppliers, logistics providers, customers, etc.) engaged through distinct types of partnerships
- Product proliferation and mass customization
- Short product life-cycles
- Globalized and diversified markets
- Changing and variable demands
- Massive data availability through new technologies (Barcodes, RFID, etc.)

Current requirements:

- Produce traceability
- Transparency
- Information visibility
- Unambiguous, complete and accurate information sharing
- Cooperative and collaborative operation
- Integration among stakeholders business processes
- Integrated information systems
- Improved KPIs related to reliability, responsiveness, agility, costs, etc.

Proposal

A supply chain (SC) domain ontology – a **formal**, **explicit** specification of a **shared conceptualization** – named **SCONTO,** that:

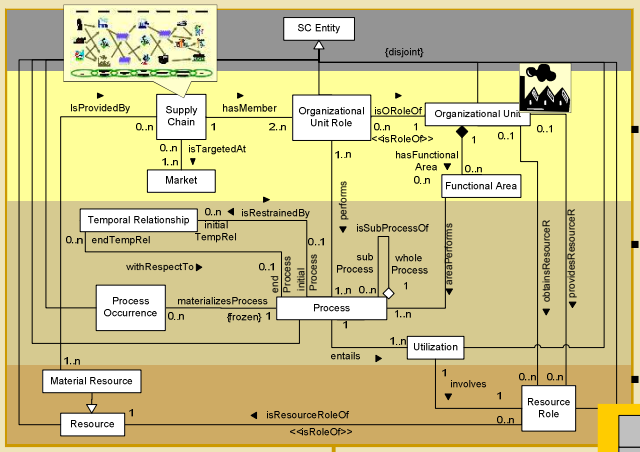
- Formally captures the SC structure (either single or multi-enterprise built-up)
- Describes partner organizations and their roles in the value chain
- Formalizes and extends the SCOR model (http://supply-chain.org/)
- Specifies inter and intra-organizational business processes
- Defines inter-process relationships
- Represents resources that partake in supply chain business processes, their roles in such processes, and flows.

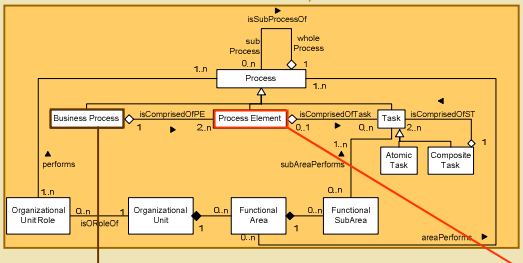
It includes an explicit, comprehensive, and formal representation of supply chain assessment-related concepts (metrics and best practices). Including:

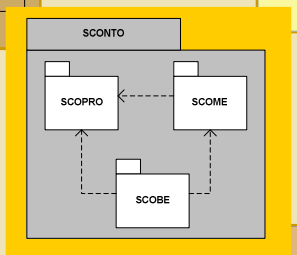
- Multi-dimensional performance evaluation frameworks
- Measurement methods for different kinds of supply chain entities
- A system that organizes and articulates metrics
- Analysis of measurement results
- Comparison among entities from different supply chains -> reference practices and points (“benchmarks”)

SCONTO

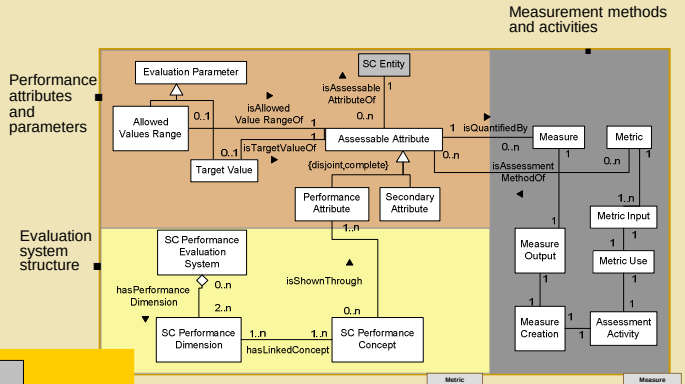
SCOPRO - SC fundamental concepts

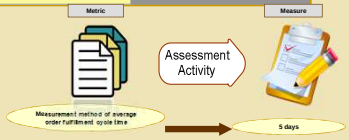






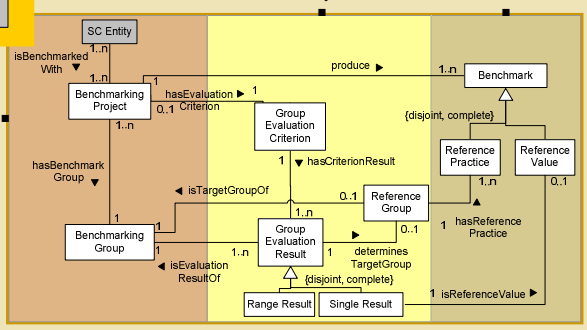
SCOME - Measurement and evaluation concepts



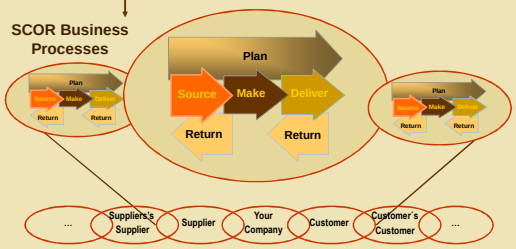


Benchmarking Analysis | Information Benchmarks

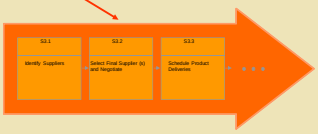
Basic Benchmarking Project Elements



SCOR Business Processes



SCOR Process Elements



Supply Chain

SCOBE - “Benchmarking” concepts

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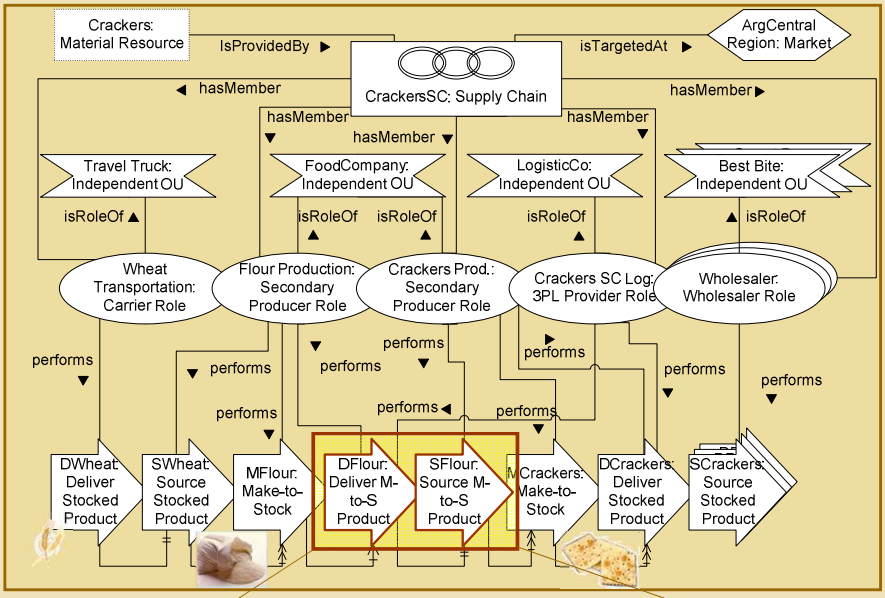
Case study

- Food supply chain
- Crackers are supplied to the Argentinean Central Region Market
- Various Value Chain Steps:
  - Flour Production
  - Crackers Manufacturing
  - Distribution
  - Commercialization
- Multiple Partners:
  - "Travel Truck"
  - "FoodCompany"
  - "LogisticCo"
  - Wholesalers, such as "Best Bite"
- Different Business Processes:
  - Source Wheat
  - Make Flour
  - Deliver Flour – Source Flour
  - Make Crackers
  - Deliver Crackers – Source Crackers
  - -----
- "FoodCompany" performs two steps in the value chain (Flour and Crackers Production)
- "FoodCompany" outsources its distribution activities to a 3PL partner, which is "LogisticCo"

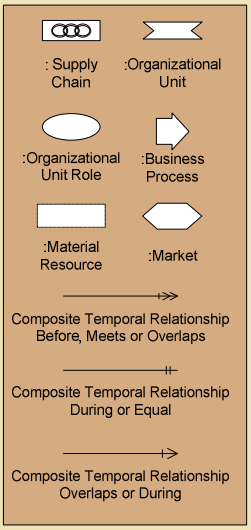
Supply Chain structure is captured

Inter-organizational business processes are explicitly represented

Temporal relationships between processes are formalized



References

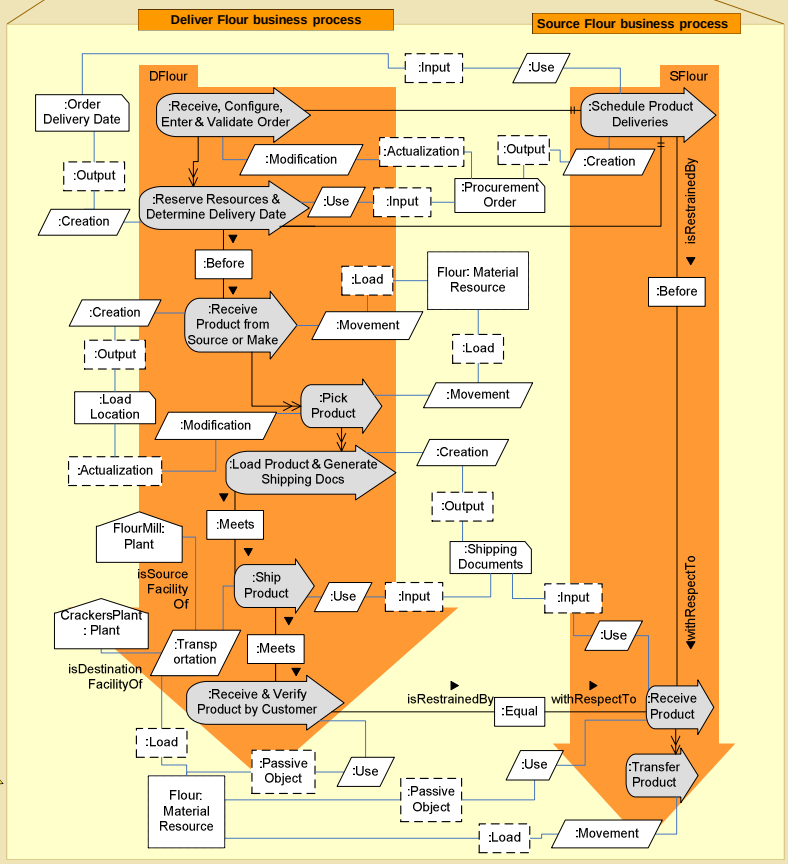


Critical links and interactions between same level processes are explicitly represented

Relevant Resources are captured

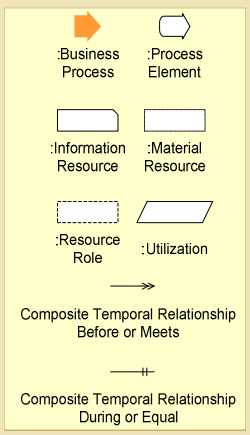
Resource roles are made explicit

The way how processes affect resources is distinguished



Hierarchical processes decomposition

References



Foundation for:

Informatics integration, traceability systems design, information visibility, evaluation systems implementation, analytical tools development, collaborative operation, etc..