The Changing Role of Gateways in the Context of Global Value Chain Dynamics

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Agenda

- Introduction: Customer Orientation and Value Management
- Logistics in Global Value Systems: Networks and Flows
- Dynamics of Logistics: Modes, Nodes, and Flows
- Gateways and Corridors: Logistical Contingencies and Configurations
Logistics Integration as Value Added
Paradigm Shift: From Volume to Value
Markets and Customers: Dynamics of Global Value Systems
Strategic Development Guideline for Gateways and Corridors: Creating Customer Value
Logistics in Global Value Systems: Networks and Flows

- Evolution of the Logistics Concept: From Fragmentation to Supply Chain Management
- Value Chain Governance
- Logistics Service Providers and Contract Logistics (3/4 PL)
- Globalization of Value Systems: Functional Specialization and Logistical Integration
Evolution of the Modern Logistics Concept

1960
- Fragmented Functions
  - Demand Forecasting
  - Purchasing
  - Requirements Planning
  - Production Planning
  - Manufacturing Inventory
  - Warehousing
  - Materials Handling
  - Packaging
  - Inventory
  - Distribution Planning
  - Order Processing
  - Transportation
  - Customer Service

1980
- First Consolidation Process
  - Materials Management
    - Demand Forecasting
    - Purchasing
    - Requirements Planning
    - Production Planning
    - Manufacturing Inventory
  - Physical Distribution
    - Inventory
    - Distribution Planning
    - Order Processing
    - Transportation
    - Customer Service

1990
- Logistics Perspective
- and new Functions

2000
- Value Chain Perspective

Adapted from: Hesse, Rodrigue (2004), 5
Logistics and Inventory Costs & Cycle Time Requirements

- Logistics Costs (% GDP)
- Inventory Costs (% GDP)
- Cycle Time Requirements (days)
Span of Integration in Value Systems

Types of Value Chain Governance

- **Market**
  - Customers
  - Suppliers
  - Price

- **Modular**
  - Lead Firm
  - Turn-key Supplier
  - Component and Material Suppliers

- **Relational**
  - Lead Firm
  - Relational Supplier
  - Component and Material Suppliers

- **Captive**
  - Lead Firm
  - Component and Material Suppliers

- **Hierarchy**
  - Integrated Firm

**Degree of Explicit Coordination**
- Low

**Degree of Power Asymmetry**
- High

*Source: Gereffi, Humphrey, Sturgeon (2003), 9.*
Strategic Positioning of Logistics Service Providers

General ability of problem solving

Ability of customer adaptation

Low  |  Medium  |  High

High
Integrators

Medium
Stand. transp firms

Low
Trad. house broker

4PL?
Main Challenges in Global Logistics: Managing Contradictions

- **Outsourcing:**
  Physical Decentralization vs. Integration

- **E-Commerce:**
  Informational Integration vs. Geographical Distance

- **Mass-Customization:**
  Customer-Oriented Orientation vs. Process-Optimization

- **Interorganizational Cooperation:**
  Strategic Partnership vs. „Virtual“ Organization

- **Integrated Control:**
  Supply Logic („Push“) vs. Demand Logic („Pull“)
Dynamics of Logistics: Modes, Nodes, and Flows

- Basic Logic of Logistical Flows
- Logistical Friction vs. Logistical Value Added
- Postponement, Just in Time and Pull Orientation as dominating Trends in Logistics Flow Control
- Nodal Functions and Value Added Logistics
- Transmodality and Intermodality
Logistics is supposed to provide the right quantity of the right good in the right quality, composition and sequence at the right time and location at the lowest possible cost / price with the highest possible reliability, security, precision, flexibility, and additional services, meeting customer requirements and confirmed features.
Structure and Process in Logistics Networks

Source: Rodrigue (2006), 6
Network Structure and Scheduling Processes

- **Point-to-Point**
  - Direct connection from A to B

- **Corridor**
  - Connection through intermediate nodes

- **Hub-and-Spoke**
  - Central hub with spokes connecting to other nodes

- **Fixed Routing**
  - Fixed routes between nodes

- **Flexible Routing**
  - Multiple routes and alternatives

- **Multiple-Hub**
  - Multiple hubs with connections

- **Nodes and Routes**
  - Transshipment node
  - Route node
  - Network node
  - Unserviced node
  - Route
  - Alternative route
Logistical Friction

- Distance in miles / km
- Distance in time
- Geographical obstacles
- Cost
- Reliability / Regularity / Congestions / Delays
- Complexity
- Modal / Flow Interfaces
- Border Crossing
- Cultural / Language Borders
Value Adding Services

- Picking & Packing
- Labeling
- Sorting
- Customization
- Final Assembly
- Facturing
- Just in Time / Sequence Supply / Delivery
Assumption: B and E are identical geographical delivery points

Differences in total costs and time due to transportation costs (mode of transportation and routing) and option to store (storage costs and time)

Option to choose alternatives 0-A-B vs. 0-C-D-E dependent on time preference and desired overall cost of delivery
Functional Scope of Logistical Nodes

- Gateways (Ports) as Intermodal Interfaces (Sea-, Air-, and Landports)
- Hubs as Transmodal Interfaces
- Merging Role of Gateways and Hubs as Intermediate Nodes in complex Networks
- Competition of Central vs. Distributed Networks
- Functional Upgrade of Logistical Nodes: From simple Transit to Value Added Logistics
- The future: „Logistics Parks“?
- Impact of Customization on required Flow Patterns and Nodal Functionality
Modal Interfaces

Transport Mode

<table>
<thead>
<tr>
<th>Roadport</th>
<th>Railport</th>
<th>Waterport</th>
<th>Airport</th>
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Intermodal Operations

- Road
- Rail
- Sea / Inland Water Way
- Air

Transshipment Mode

- Port (Container) Yard
- Intermodal Terminal
- On-dock Rail
- Transloading
Principles of Flow Control

Point to Point

- Receiving
- Sorting
- Shipping

Hub / Cross Docking

- Logistics Center
  - Receiving
  - Sorting
  - Shipping
Flow Patterns in the Transport Chain

Stage:
- Parts and raw materials
- Manufacturing and assembly
- Distribution

Network:

Flows:
- Bulk Shipping
- Unit Shipping
- LTL Shipping

Volumes vs. Frequency
Flow Logic of Value Chains

- **Pure Standardization**
  - Design
  - Fabrication
  - Assembly
  - Distribution

- **Segmented Standardization**
  - Design
  - Fabrication
  - Assembly
  - Distribution

- **Customized Standardization**
  - Design
  - Fabrication
  - Assembly
  - Distribution

- **Tailored Customization**
  - Design
  - Fabrication
  - Assembly
  - Distribution

- **Pure Customization**
  - Design
  - Fabrication
  - Assembly
  - Distribution

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**Speculation Postponement**
Logistical Paradigm Shift (1)

- From Consolidation to Customization
- Timeliness and Reliability
- Total Service provided
- Total Cost of Ownership
- Total Value Chain Control
- Flexibility and Robustness
- Federated / Distributed Value Chains
Logistical Paradigm Shift (2)

- Smaller Shipments
- Higher Frequencies
- Higher Customization
- Higher Flexibility
- Higher Value Density
- Higher Global Complexity
- Higher Modal Complexity / Multiple Modality
- Higher Nodal Complexity
Re-Assessing Port-Corridor Integration
From Hinterland Accessibility to integrated Network Functionality
Local Impacts of Global Flow Imbalances
Modal and Nodal Choice in the Light of Total Cost of Ownership and Total Value Added
Contingencies of Network Configurations
The Global Ocean Shipping Network: Major Nodes and Flows

Source: Rodrigue (2006), 7
Trade (exports) between main regions, growth forecast 2005-08

Source: “Shining Examples" in: The economist, 17.6.06, p. 5.
Major US Modal Gateways, 2004

Source: Rodrigue (2006), 9
Growth and Imbalance of Global Air Cargo Flows

FTKs (billions)

- PRC – North America
- PRC – Europe
- Domestic US
- Domestic PRC
- Asia – North America
- Europe – North America
- Asia – Europe
- North America – Europe
- Europe – PRC
- North America – Asia
- North America – PRC
- Europe – Asia
- Japan – North America
- South America – Europe
- South America – North America
- Japan – Europe
- North America – Japan
- Africa – Europe
- Europe – Japan
- Europe – Africa

2005 traffic  2006-2025 growth
North American Landbridges

Source: Rodrigue (2006), 5
European Spatial Development Perspective: Vision of a Future European Polycentric Gateway and Network System

Source: Woxenius (2001), 14
Future Role of Gateways and Corridors: Opportunities and Risks

- Limits of Centralization: Polycentric Networks!
- Specialization / Differentiation
- Allocation / Attraction of Value Adding Logistics
- Exploiting Further Potentials of Multimodality
- Global Trends / Shifts of Goods Flows
- Transnational Approaches / Global Reach of Gateways and Corridors
- Impacts of Uncertainties: Strategic Flexibility
DUBAI Logistics City
The Future Gateway Model?
Thank You!
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