

Chapter4

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4.1 Drivers and logistics implications of internationalization:

Key issue: What are the trade-offs between responsiveness to local markets and economies of scale? The business approach towards internationalization is not taking place according to any common pattern.

In assessing the nature of cross-border logistics, three questions can be asked: Does internationalization imply a universal global approach to supply chain management? Does internationalization require a 'global' presence in every market? Does internationalization distinguish between the companies that globally transfer knowledge and those that do not? The arguments presented in this section suggest that the answer to each of these questions is 'no'.

In response to local crises in quality, and suffering from local competition, the corporate headquarters were downsized to help empower the local organization. Somewhere between local and global extremes, Procter & Gamble and Unilever will meet each other in a new competitive area. Looking at the different drivers of internationalization, three basic global shifts in international investment and trade have been identified, with a possible fourth coming to the forefront in modern markets. The 'fourth generation' recognizes the logistics trade-off between responsiveness to local markets, environmental and risk concerns with the benefits of internationalization.

At a company level, generic drivers of internationalization include:

- a search for low factor and supply costs(land , labor, materials).
- the need to follow customers internationally in order to be able to supply locally and fast.
- a search for new geographical market areas.
- a search for new learning opportunities and exposure to knowledge.

Table 4.1 The fourth-generation global shift in Europe

Generation	First	Second	Third	Fourth
Period	1950s–1960s	From 1960	From 1980	Emerging now
Primary drivers	Labour shortage	Labour costs and flexibility	Market entrance	Responsiveness to customer orders, risk reduction, and social and environmental responsibility
Shift of labour and investment towards	European countries without labour shortage	Newly industrialised countries, low labour cost countries	Eastern Europe, China, Latin America	Market region for responsiveness and lower risk. To low-cost region for social responsiveness initiatives
Transport routes	Still significantly continental	Increasingly intercontinental	Adding additional destination regions	Beginning to refocus on continental
Nature of international flow of goods	Physical distribution of finished products from new production locations	Shipping parts to production locations and exporting finished products	Physical distribution towards new market regions	Shipping (semi-) finished products to markets, reduction of eco footprint and risk exposure where possible

Table 4.2 provides examples of strategic contexts, and – in the bottom row – the logistics implications of those strategies. The multi-domestic and global strategies represent two extremes, while the integrated network strategy represents a balance between them. The consequences of this ‘balancing act’ for logistics are analyzed.

Table 4.2 Dimensions of different internationalism strategies

Dimension	Setting in a pure multi-domestic strategy	Setting in a pure global strategy	Setting in an integrated network strategy
Competitive moves	Stand-alone by country	Integrated across countries	Moves based on local autonomy and contribution of lead subsidiaries, globally coordinated
Product offering	Fully customised in each country	Fully standardised worldwide	Partly customised, partly standardised
Location of value-adding activities	All activities in each country	Concentration: one activity in each (different) country	Dispersal, specialisation, and interdependence
Market participation	No particular pattern; each country on its own	Uniform worldwide	Local responsiveness and worldwide sharing of experience
Marketing approach	Local	Integrated across countries	Variation in coordination levels per function and activity
Logistical network	Mainly national; sourcing, storage and shipping on a national level and duplicated by country	Limited number of production locations that ship to markets around the globe through a highly internationalised network with limited localised warehouse and resources	Balanced local sourcing and shipping (e.g. for customised products and local specialities) and global sourcing and shipping (for example for commodities)

(Source: Based on Yip, 1989, and Bartlett and Ghoshal, 1989)

1- Logistical implications of internationalization

Internationalizing logistics networks holds consequences for inventory, handling and transport policies.

Inventory: Centralizing inventories across multiple countries can hold advantages in terms of inventory-holding costs and inventory levels that are especially relevant for high-value products.

Handling: Logistics service practices may differ across countries as well as regulation on storage and transport.

Transport: Owing to internationalization, logistics pipelines are extended and have to cope with differences in infrastructure across countries, while needing to realize delivery within the time-to-market.

2-Time-to-market.

Time-to-market has particular significance for the management of the global logistics pipeline. Although we shall touch on the following issues here:

- product obsolescence;
- inventory-holding costs.

Product obsolescence: The extended lead time inherent in international logistics pipelines means that products run the risk of becoming obsolete during their time in transit.

Inventory-holding costs: Lead time spent in the logistics pipeline increases the holding cost of inventory. In addition to the time spent in physical transit, goods traveling internationally will incur other delays.

3-Global consolidation: Global consolidation occurs as managers seek to make best use of their assets and to secure lowest-cost resources. This approach leads to assets such as facilities and capital equipment being used to full capacity, so that economies of scale are maximized. Resources are sourced on a global scale to minimize cost by maximizing purchasing leverage and to pursue economies of scale. The types of resource acquired in this way include all inputs to the end-product, such as raw materials and components, and also labour and knowledge. Familiar features of global consolidation include: sourcing of commodity items from low-wage economies; concentration at specific sites; bulk transportation.

Sourcing commodity items from low-wage economies: Two sourcing issues are used by internationally operating organizations: consolidation of purchasing of all company divisions and companies; sourcing in low-wage economies. Internationally operating organizations seek to consolidate the purchasing made by all their separate divisions and operating companies. This allows them to place large orders for the whole group, which enables them to minimize costs by using their bargaining power and by seeking economies of scale. Internationally operating companies are on a constant quest to find new, cheaper sources of labour and materials. These advances in social standards raise the cost of labour and other resources. The relentless search for the lowest production cost has led to some companies re-sourcing commodity items to lower-wage countries in Asia, North Africa and South America. In some cases this movement of facilities around the globe has come full circle, with Asian companies setting up plants in the UK not only to gain access to the EU market but also to take advantage of lower overall costs.

Concentration at specific sites: Consolidation of purchasing applies not only to commodity goods but also to high- value or scarce resources. Research and development skills are both high value and scarce. Therefore there is an incentive to locate at certain sites to tap into specific pools of such skills. Examples of this are 'Silicon Valley' in California and 'Silicon Fen' near Cambridge as centers of excellence in IT. Companies originally located in these areas to benefit from research undertaken in the nearby universities. Companies become more influential in directing such research and benefiting from it if they have a significant presence in these locations. This is helped if global research is consolidated onto a single site. While this may mean missing out on other sources of talent, consolidated R&D gives a company a presence that helps to attract the bright young minds that will make their mark in these industries in the future, and it allows synergies to develop between research teams.

Bulk transportation: One of the more obvious advantages of operating a company in a global manner is the cost advantage of consolidated transportation. Taking Procter & Gamble as an example, 350 ship containers, 9,000 rail car and 97,000 truck loads are transported every day. The opportunity for cost saving by coordinating these movements and maximizing utilization is significant.

4-Risk in international logistics: In addition to time-to-market and inventory risks, events of recent years have forced companies to adapt to the new supply chain reality of expecting the unexpected.

Geopolitical threats: The 2003 SARS crisis and the second Gulf War were major events in and of themselves; they were also consecutive and had huge impacts on supply chain continuity and execution feasibility. Major trade routes had to be altered and global travel was limited. In addition, structurally heightened government security measures and screening are indicators of risks involved in international logistics. Logistics making the global economy a reality can never be a given that deserves no second thought.

Transportation breakdowns: A several-week strike in the US west coast ports in 2002 lasted long enough to almost cripple the US economy. With hundreds of cargo ships floating outside the ports, shipments were not arriving at US destinations. For example, return shipments were delayed because no ships were leaving the ports either. And in fact a resulting global shortage of containers caused a slowdown of shipments in many other port regions. So shipments on other routes, in different harbors and even shipments using different modalities were affected.

4.2 The tendency towards internationalization Key issue: How can we picture the trade-offs between costs, inventories and lead times in international logistics? In order to remain competitive in the international business environment, companies seek to lower their costs while enhancing the service they provide to customers. Two commonly used approaches to improve the efficiency and effectiveness of supply chains are focused factories and centralized inventories.

- 1. Focused factories from geographical to product segmentation:** Many international companies, particularly in Europe, would have originally organized their production nationally. In this situation, factories in each country would have produced the full product range for supply to that country. Over time, factories in each country might have been consolidated at a single site, which was able to make all the products for the whole country. This situation, in which there is a focus on a limited segment of the geographical market. The focused factory strategy involves a company's consolidating production of products in specific factories. Each 'focused factory' supplies its products internationally to a wide market and focuses on a limited segment of the product assortment.
- 2. Centralized inventories:** In the same way that the consolidation of production can deliver cost benefits, so can the consolidation of inventory. Through centralizing inventory, major savings can be achieved by lowering overall speculative inventories, very often coupled with the ability to balance peaks in demand across regional markets from one central inventory. In product environments where inventory costs are more important than the distribution costs, centralized inventories are a relevant concern.
Microchips are an extreme example: these products are of such high cost per volume unit that distributing from the moon could still be profitable! Distribution costs have a marginal impact on logistics costs per product, assuming of course that transport costs are mainly a function of volume and weight. Centralizing inventory may lead to lower factory-to-warehouse distribution costs because shipments can be. In general, transport costs have continued to decline over time as a relative cost item because of innovations in transport technology, the commoditization of transport, and the oversupply of transport capacity for basic transport. Centralized inventory management and focused factories enable different delivery strategies to be combined.

4.3 The challenges of international logistics and location

Key issues: What are the risks in international logistics in terms of time and inventories, and how can they be addressed?

International logistics is complex, and different from localized logistics pipelines. The main differences that need to be taken into consideration are:

- extended lead time of supply;
- extended and unreliable transit times;
- multiple consolidation and break points;
- multiple freight modes and cost option.
- price and currency fluctuations.

Information technologies can help to circumvent these challenges in general, and the proper location of international operations in particular can help to re- solve some of these challenges.

1. **Extended lead time of supply:** In an internationally organized business most products produced in a particular factory will be sold in a number of different countries. In order to manage the interface between the production and sales teams in each territory, long lead times may be quoted. This buffers the factory, allowing it to respond to the local variations required in the different markets.
2. **Extended and unreliable transit times:** Owing to the length and increased uncertainty of international logistics pipelines, both planned and unplanned inventories may be higher than optimal. A comparison of the length of domestic and international product pipelines and their associated inventories. Variation in the time taken for international transport will inevitably lead to increased holding of inventory with the aim of providing safety cover.
3. **Multiple consolidation and break points:** Consolidation is one of the key ways in which costs in pipelines can be lowered. Products manufactured in India should be consolidated at the site on the east coast for shipping to Singapore. Here they are combined with the output from the Thai and Singapore factories and shipped to Hong Kong. Products are consolidated at a Chinese port, possibly Shanghai, and transported by rail or sea to Hong Kong. All the other manufacturing sites deliver direct to Hong Kong, where products from all the various facilities are consolidated and shipped to Los Angeles. It is worth noting that, after arrival in LA, this process runs in reverse. The consignment will be broken down at various 'break points' throughout North America and the goods distributed to market via hubs.
4. **Multiple freight modes and cost options:** Each leg of a journey between manufacture and the market will have a number of freight mode options. These can be broken down in simplistic terms into air, sea, rail and road. Within each of these categories lies a further range of alternative options. Each of them can be assessed for their advantages and disadvantages in terms of cost, availability and speed. When the journey along the supply chain involves multiple modes, the interface between them provides further complication
5. **Price and currency fluctuations:** When operating around the globe, fluctuations in currencies along the supply chain can have an impact on how the supply chain is configured. While it can take years to develop a global supply chain structure and operational footprint, currencies fluctuate daily – and sometimes wildly. Such fluctuations do not favor operations in countries with an unstable currency, and explain why some countries and industries do most of their business in a single currency, even if not their own. For example, price fluctuations of fuel have impacted the feasibility of international shipping against the benefits of lower, centralized inventories.

6. **Location analysis:** A structural component of international logistics pipeline design is the location design, deciding where operations are going to be performed. There is a sequence to the decision-making process involved that incorporates the business (left-hand side) and geographical decision making (right-hand side). Business decision making evolves from a strategic commitment through a decision support analysis project to implementation of the resulting plan at a selected location.

In parallel, the location analysis starts at the level of relevant continent, through consideration of relevant countries and regions, to the selection of a location.

The typical four-phase decision-making process can be structured using the following steps:

- 1- Deciding upon the appropriate level of centralization–decentralization using, for example,
- 2- Selecting relevant location criteria.
- 3- Selecting criteria weightings.
- 4- An economic trade-off analysis of structures and relevant locations.

4.4 Organizing for international logistics

Key issue: How can supply chains be better organized to meet the challenges of international logistics?

There are at least three elements in organizing for international logistics. These are:

- layering and tiering;
- the evolving role of individual plants;
- reconfiguration processes.

These will be outlined in the following subsections.

1. Layering and tiering: A commonly used maxim is global coordination and local operation, which relates to laying out the flow of information and coordination differently from the map of the physical operations. For example, Hewlett-Packard (HP) operates a globally consistent and coordinated structure of product finalization and distribution in contrast to its continental operations. This final configuration process (which in the case of HP may include fit-ting power leads and local instructions) is referred to as postponement. HP brings only limited management expertise to these regional operations to assure global coordination. Thus, although HP operates in a globalized way, its products are tuned to local markets by means of local logistics operations. In this industry, major original equipment manufacturers (OEMs) structure their plant networks globally, while making suppliers build their plants in the immediate vicinity of the OEM plant. The distance or broadcasting horizon between the two plants is defined by the time between the electronic ordering of a specifically finalized single module on the online system and the expected time of delivery in sequence along the assembly line.

2. The evolving role of individual plants: Ferdows (1989) projects the theories by Bartlett and Ghoshal (1989) onto the role of individual plants/factories in achieving the targeted international capabilities of global efficiency, local responsiveness and worldwide learning, or a combination of the three. These developments could be driven by poor location conditions, an inability to reach supply chain objectives, or the ability to reach the supply chain objectives more easily at other plants in the company's network. Most relevant, the evolutionary roles and functions of individual plants within the evolving supply chain are specific issues of concern for the realization of global objectives.

3. Reconfiguration processes: Related to this last point, the achievement of the required

changes in international logistics pipelines is a central issue. It was found that, across companies, large differences can be found in reconfiguration paths. This was found even in cases where the same supply chain structure (a traditional factory warehouse, was targeted. Differences included:

- **Supply chain scope/activities involved.** Was only final manufacturing relocated, or did sourcing undergo the same treatment?
- **Focus.** Were activities moved into the market, e.g. localized or centralized within the market? Did the move have a single or multiple focus?
- **Tendency.** Were activities moved out of the (European) market or vice versa, with single or multiple tendencies?
- **Timetable.** Was it a single-step process or did it involve various steps spanning out the process over a longer period of time?
- **Pace.** Was it an overnight change or the result of a gradually changing process?
- **Authority.** Was it directed from a global base (top down) or built up region by region (bottom up)? The differences can be explained through differences in the supply chain characteristics of companies, among which are:
 - **Starting point:** Is the base structure localized or globalized?
 - **Tradition:** Does the company have a long preceding history with the baseline in the market, or can it be built up from scratch, in supply chain terms (brown-field or greenfield)?

Figures 4.11 and 4.12 represent the reconfiguration process from local distribution through logistics centralization to postponed manufacturing (final manufacturing in the warehouse). The differences in the implementation path are based upon the different starting points. The path with a localized starting point goes through centralization within Europe starting from autonomous, duplicated local structures. The path with a global starting point builds a small European presence and then migrates through the increase of European presence centrally (representing a further location into Europe, rather than a further centralization from within Europe).

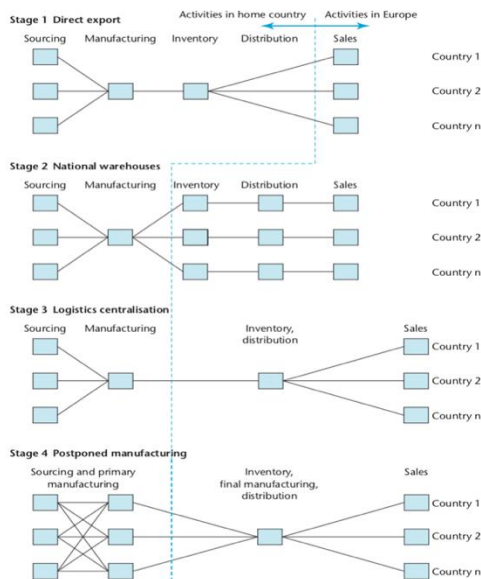


Figure 4.12 Stages in the implementation of postponed manufacturing: global starting point
(Source: van Hoek, 1998)

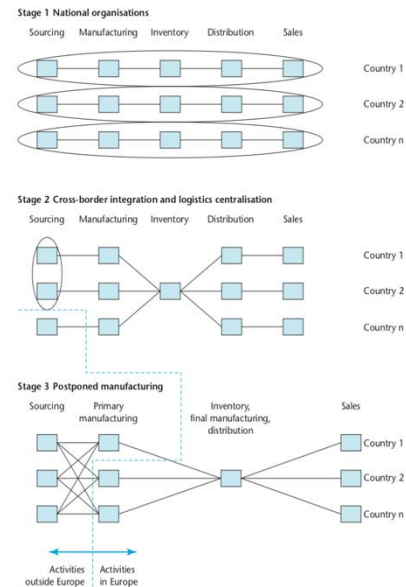


Figure 4.11 Stages in the implementation of postponed manufacturing: local starting point
(Source: van Hoek, 1998)

4.5 Reverse logistics

Key issue: factoring in the return flow of goods when designing international networks

Reverse logistics deals with the flow of goods that go back up the supply chain for a number of reasons, including: product returns, repairs, maintenance and end- of-life returns for recycling or dismantling.

Suggested ways forward include considering the full impact of reverse logistics and approaching it as a business:

- consider reverse logistics for its full cost and negative potential market impact;
- seek green as a business ('green is green');
- design for disassembly and recycling;
- outsource reversed operations to a specialist 3PL;
- create dedicated (parts of) operations.

Reasons why reverse logistics is often only partially incorporated into international network design include:

- no infrastructure: companies often try to use the same outbound distribution system to handle returns without considering whether it is fit for purpose;
- reverse logistics is often a 'corner-of-the-desk concern', and does not receive sufficient resources;
- much attention on the subject is driven by legislation, not yet by recognized business value;
- focal firms see reverse logistics as a cost of doing business;
- the subject is intuitively not popular: it means something has gone wrong, so people are tempted to ignore it or hide it;
- it is hard to forecast the reverse flow and composition – what is going to come back.

4.6 Managing for risk readiness

Key issue: developing appropriate responses to risk in both the short and long term.

Supply chain disruptions such as transportation breakdowns and geopolitical risks can have many impacts: empty distribution channels, stores and goods stuck upstream leading to lost sales, revenue and customers. There are at least two levels at which companies are responding to risk in international logistics; preparing for immediate response to risks and structurally preparing for risk in international supply chains.

1. Immediate risk readiness

Recent events have shown that immediate responses to risks can include four things:

- raised inventory levels to assure a cushion for supply disruptions of key parts and supplies;
- redrawing transportation scenarios in the light of the possible logistics melt- down of global trade routes;
- supplier hedges are put into place; and
- global sourcing and supplier rationalization efforts are being reconsidered actively.

Inventory policies to reflect volatility levels:

Shortly before the second Gulf War, GM and Toyota asked their just-in-time suppliers to raise inventory levels in order to avoid early and extensive plant shut- downs. It added short-term costs but as a hedge against supply disruptions it can be a real money saver down the line while assuring service to the customer that competitors might not be able to offer. LaCrosse Footwear raised its safety stock sixfold for certain products in order to ensure the ability to ship to customers on short notice.

Re-do transportation network redesign:

Based upon possible risks or a real situation, scenarios for transportation routes at risk can be developed together with contingency plans on a route-by-route and plant-to-plant basis. Airlines altered services to the Middle East before the Gulf War, for example. Here are three other examples:

- Hewlett Packard maintains the ability to shift production between assembly facilities in Europe, North America, South America and Asia as part of a formal continuity plan to be implemented in a crisis.
- Chrysler quickly shifted component shipment from air to express truck service in response to transportation bottlenecks after 9/11.
- Continental Tyre's crisis team put together a list of all customers' orders, parts and suppliers outstanding, identified critical shipments by the afternoon of 9/11, and expedited those critical parts by land transport and through contingency relationships with transport firms.

Reconsider sole and global sourcing arrangements:

Despite the benefits of supplier rationalization and focused factories, risk management does imply there is real rationale for lining up alternative suppliers in different locations, and for manufacturers to develop a thorough understanding of their suppliers' capabilities and vulnerabilities. Companies are responding in two ways: considering alternative and back-up sources; and proactively auditing the supply base for financial and operational sustainability in these tough times. Hewlett Packard, for example, has secondary suppliers for all critical components as part of its continuity plan.

2. Structural risk readiness

Because risk needs to be an ongoing focus, companies are increasingly devoting dedicated teams to risk management in the supply chain. These teams can do several things:

- develop contingency plans and risk protocols;
- audit preparedness;
- train plant management and staff;
- report to senior management on risk profiles and preparedness.

Most important, however, is not to leave risk management in the supply chain solely the responsibility of a team, but to use the team to create an ongoing organization wide focus and effort. Most often teams help plant management and various functions in the organization, instead of telling them what to do. Henkel, the German consumer goods company, for example, has appointed risk teams to work with various departments in assessing risk. It raises fundamental awareness across the organization, and is the basis for developing contingency plans proactively.

4.7 Corporate social responsibility in the supply chain

Key issue: Companies operating international or global supply chains need to incorporate social responsibility into their supply chain design.

Broadly defined, CSR in the supply chain deals with the social and environmental consequences of supply chain operations. Making a global supply chain environmentally sustainable and socially considerate is harder than just doing so for a focal firm. This is due to global reach and the fact that multiple companies are involved. As a result, it is harder to assess and improve operating policies across the entire supply chain. Yet this is a key opportunity to bring CSR to life.

Examples of CSR efforts include:

- incorporating CSR standards and suggested efforts in purchasing policies.
- conducting supplier audits to identify improvement opportunities, and following up on issues that are

found (do not say you can't see it when you can go and look);

- taking ownership of CSR initiatives by running supplier development sessions, and by collaborating on improvement projects

Table 4.8 NEC CSR supplier requests

Risk management priority	Action item
CSR general requirement	Promote positive CSR activities Contribute to the society and community
Product quality and safety	Ensure product safety Establish and apply a quality management system
The environment	Control hazardous chemicals in products Control hazardous chemicals in manufacturing Establish and apply an environmental management system Minimise environmental pollution (water, soil, air) Obtain environmental permits Promote resource and energy saving by reusing, reducing and recycling Promote greenhouse gas reduction Promote waste reduction Disclose environmental preservation activities
Information security	Secure computer networks against threats Prevent the leakage of personal information Prevent the leakage of confidential information of the customer and third party
Fair trading	Prohibit corruption and bribery Prohibit abuse of a superior position Prohibit the offering and receiving of inappropriate profit and advantage Prohibit impediment to free competition Provide correct information on products and services Respect intellectual property Use appropriate company information Detect injustice promptly
Occupational health and safety	Apply safety measures for equipment and instruments Promote safe activities in the workplace Promote hygiene in the workplace Apply appropriate measures for occupational injuries and illnesses Properly manage disasters and accidents Be careful about physically demanding work Promote safety and hygiene in all company facilities Promote health maintenance programmes for employees
Human rights	Prohibit forced labour Prohibit inhumane treatment and infringements of human rights Prohibit child labour Prohibit discrimination Pay appropriate wages Control working hours Respect the right to freedom of association

(Source: NEC Group CSR Guideline for Suppliers, http://www.nec.co.jp/purchase/pdf/sc_csr_guideline_e.pdf)