

7. Logistics

Introduction

In 3. Modal Considerations¹ we brought up the notion of that the time and place utility associated with transportation is not the sole consideration in the mind of the customer. That is, transportation lies within a larger context. This idea has also shown up in the other lecture notes associated with Transportation Management.

The diagram that reflects this is shown here.

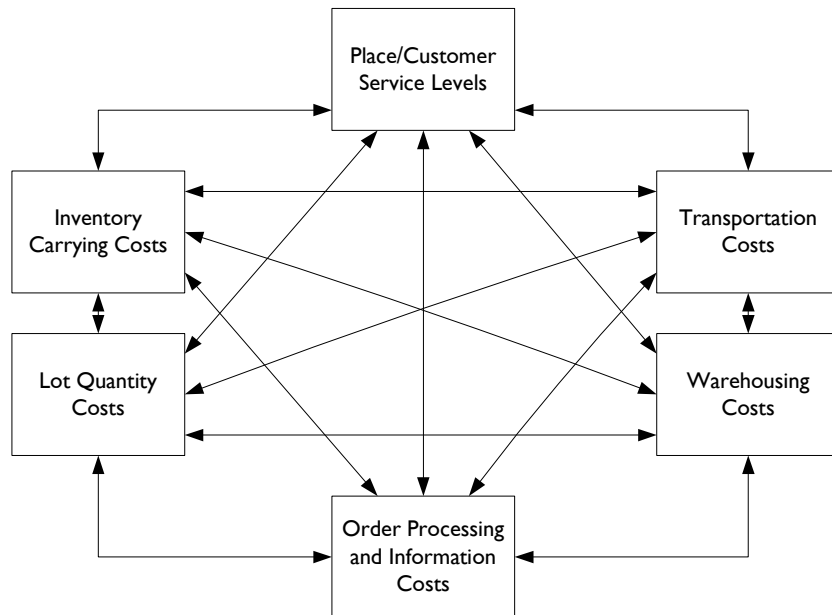


Figure 1 Transportation as a Component of Cost²

¹ James Drogan, "3. Modal Considerations," (2007), vol.

² James R. Stock and Douglas M. Lambert, Strategic Logistics Management, Fourth ed. (McGraw-Hill, 2001).

Logistics, as you might expect, also lies in a context.

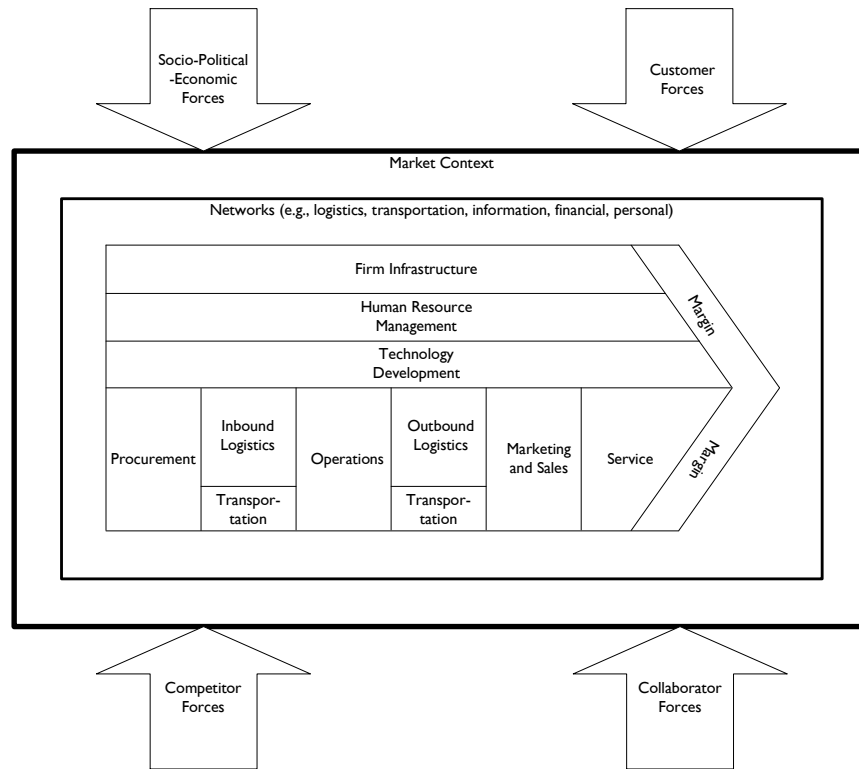


Figure 2 The Context of Interest³

When we move from a transportation centric view to the larger contexts we need to provide consideration for the wants and needs of others.

The customer may not want the lowest transportation costs, but the lowest cost that allows him to meet his requirements for service.

The customer wants the right product in the right place at the right condition and right price such that his customers prefer his product over a competing product.⁴

A governmental organization may wish to utilize transportation in support of a larger societal change and may have a different set of goals and objectives that guide transportation management decisions.

Our ability to manage transportation effectively and efficiently depends upon our understanding of the goals and objectives of the customer.

Transportation moves freight – inventory. Logistics is often considered as the management of inventory while at rest or in motion. Hence, what links transportation management and logistics is inventory, and assisting in the optimum management of this inventory should be one of the goals of transportation management.

The first formal pursuit of this goal by a transportation company of which I am aware was by the Burlington Northern Railroad in the first half of the 1980s. This development is covered very nicely in two Harvard Case Studies.⁵

³ Adapted from Michel E. Porter, *Competitive Advantage: Creating and Sustaining Superior Performance* (The Free Press, 1985).

⁴ Sometimes called the 4Rs of Marting.

⁵ Janice P. Hammond, *Burlington Northern (a)* (Harvard Business Review, 1989). and Janice P. Hammond, *Burlington Northern (B)* (Harvard Business Review, 1989).

I cite the descriptions of these two items to give you a feel for the issue and how it was addressed:

From Burlington Northern (A):

“Describes the forces that led to the development of a logistics analysis program by the Burlington Northern Railroad. The first half of the case describes changes in industrial structure, technology, demographics, shipper practices, and government regulation that led to the general decline of the railroad industry following World War II. The remainder contains the Burlington Northern's competitive response to its changing environment, including the company's decision to develop a logistics analysis program to improve their employees' and their customers' understanding of logistics. Also contains an example of logistics cost tradeoffs.”

From Burlington Northern (B):

“Describes the experiences of a seasoned Burlington Northern (BN) sales representative after the introduction of ShipSmart, a decision support system developed by the BN to help its employees and customers analyze logistics problems. After a brief description of a logistics training program for sales representatives, the case describes an opportunity for new business for the BN (shipping beer from a brewery to beer distributors by rail, rather than truck) identified by the sales representative. Realizing the new business will require the coordination of logistics channel partners (the brewery, the distributors, and the railroad) as well as interfunctional coordination (between marketing, engineering, and operations) within the railroad. The sales representative weighs the complexities of the problem and considers the use of ShipSmart to demonstrate the value of switching to rail transport to the distributors and the brewery.”

Leading edge transportation service providers are marked by their ability to discuss the impact of transportation on the whole of logistics.

Table 4 Impact of Transportation Costs on page 7 of 3. Modal Characteristics gives a general statement of impact of changing transportation costs on the four other cost factors shown in Figure 1 Transportation as a Component of Cost on page 1. The relationships are not, in reality, linear, nor are the impacts of the same magnitude.

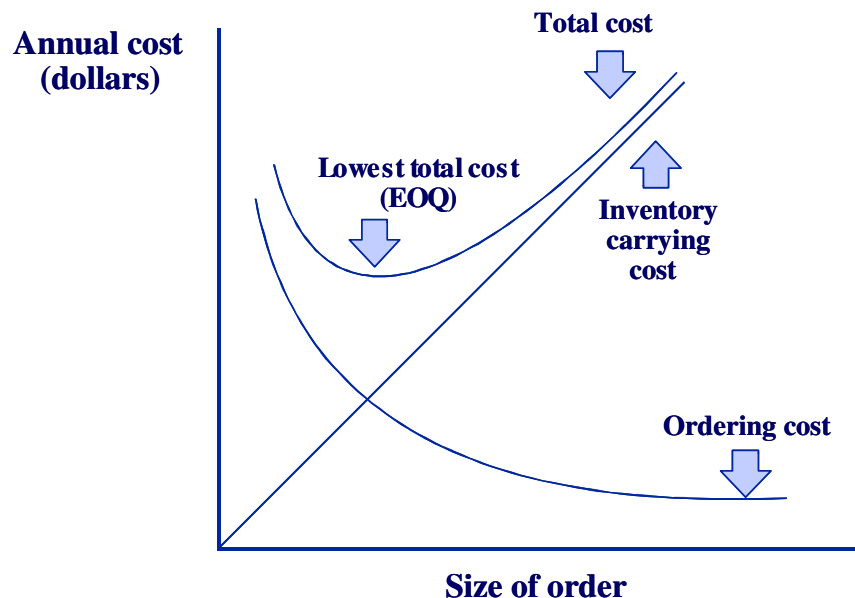


Figure 3 Cost Trade-offs to Determine the Most Economic Order Quantity⁶

⁶ Stock and Lambert, *Strategic Logistics Management*, Figure 6-4 page 237

Figure 3 shows two of the five interrelated cost factors that concern us in logistics. Imagine including the remaining three factors. There is a point where the addition of the five costs yields the lowest total cost to the customer for the desired service level. The reader is referred to chapters six and seven of Stock and Lambert for additional detail.

Consideration of logistics, like consideration of intermodal transportation, requires that a business begin to understand much more about and share much more information with its customers, collaborators⁷, and suppliers. And, of course, for this collaboration to work the understanding and sharing must go in both directions.

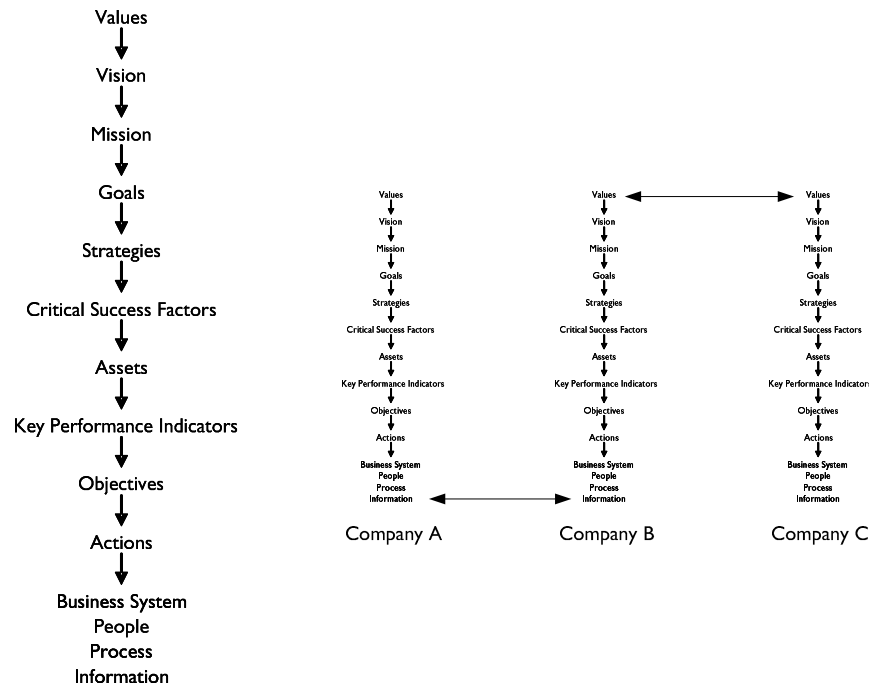


Figure 4 The Business Configuration and Sharing

To the left in Figure 4 is a representation of the configuration of a business. It represents the components of a business and implies a relationship between these components.⁸

The right side of the figure aims to suggest by the arrows levels of understanding and sharing. Companies A and B have a low level of understand and sharing; companies B and C have a high level of understanding and sharing.

Another way of looking at the right side of Figure 4 is that companies B and C are closely linked in a value chain, while companies A and B are loosely linked in a value chain.

The idea of value chains is based on the work of Michael Porter of Harvard.⁹ You met this structure first in 4. Networks and it was repeated in Figure 2 The Context of Interest on page 2 of this note.

⁷ Collaborators are those parties that work together to achieve a desired outcome. Intermodal, for example, may require two or more companies to collaborate to provide the service.

⁸ See James Drogan, *A Note on Business Drivers, Business Configuration, and Information Technology Strategy*, July 19, 2005 2005, <http://jmsdrngn.squarespace.com/storage/A%20Note%20on%20Business%20Drivers%20Business%20Configuration%20and%20Information%20Technology%20Strategy.pdf>, and James Drogan, *Thinking About the Business Configuration*, 2007, <http://jmsdrngn.squarespace.com/storage/Thinking%20About%20the%20Business%20Configuration.pdf>, [February 28, 2007]. for additional information on the business configuration.

⁹ Porter, *Competitive Advantage: Creating and Sustaining Superior Performance*.

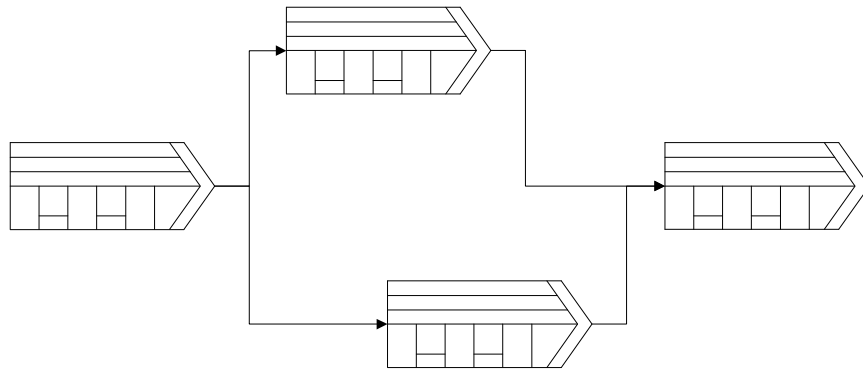


Figure 5 Linking Porter's Structure in a Value Chain

Here we have four companies linked together to provide the value required by a customer. It should be obvious that the more closely linked companies are through understanding and sharing, then the more efficiently and effectively value will be delivered to the final customer.

Consideration of logistics broadens the areas in which one must have knowledge, skills, and experience. Perhaps this is best explain by reflecting on transportation in a regulated world (pre-1980 in the US) and a deregulated world.

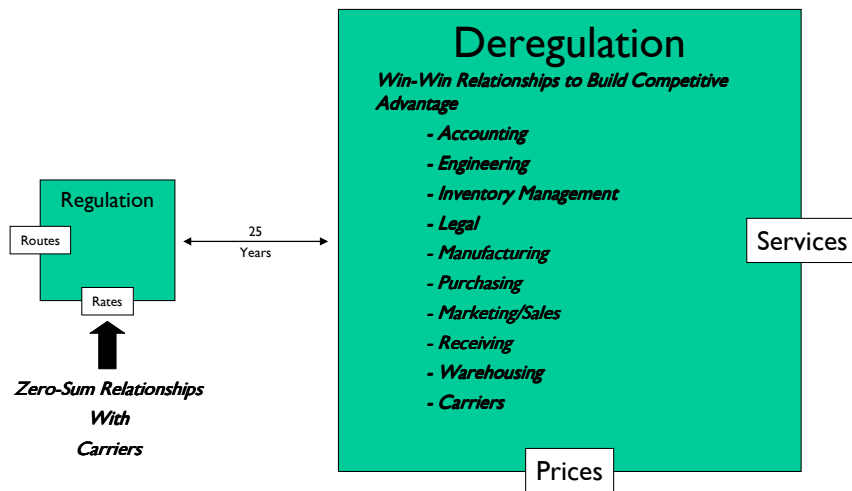


Figure 6 Regulation and Deregulation¹⁰

In a regulated world economic and service decisions were tightly constrained by the government. There was little room for negotiation between carriers and shippers. The result was often a zero-sum game between the two parties. One side won; the other lost.

But the knowledge, skills, and experience to manage transportation was little more than applying the legal tariffs (no mean feat in itself) that yielded a certain rate over a certain route. Everything was public.

In the deregulated world the room for negotiation between the carriers and shippers vastly expanded. One could negotiate services and prices that allowed both parties to win. The negotiations resulted in contracts that could be kept confidential. Competition was introduced into the transportation marketplace. Service improved, prices dropped. True, companies that could not compete in this new world went out of business, but those that could, flourished.

As a result, the costs of logistics dropped.

¹⁰ J. Drogan, *GBTT 351 International Logistics Spring 2006 Key Points*, Maritime College, April 26, 2006

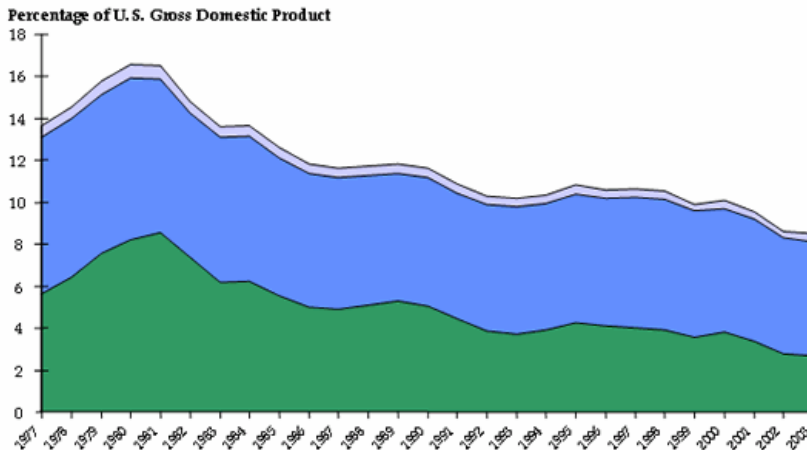


Figure 7 Logistics Costs as a Percentage of US GDP¹¹

Accompanying this figure is the following narrative.

“While the United States has seen remarkable improvements in freight transportation since the 1980s, congestion threatens to increase travel times, drive up logistics costs, and undermine the reliability of freight shipments. The problem of congestion is especially acute for trucking.

One measure of the performance of the nation's freight transportation system is total logistics cost. Total logistics cost is the cost of managing, moving, and storing goods. The major components of total logistics cost are administration (e.g., management, insurance), transportation (e.g., by truck, rail, air, and water), and inventory carrying costs. Figure 2.1 shows total logistics cost as a percentage of the U.S. gross domestic product (GDP). Logistics costs rose through the 1960s and 1970s to a high of about 16 percent in 1980, then declined through the 1980s and 1990s. Total logistics costs today are estimated to be about eight percent of GDP.

A major factor in the decline in total logistics cost has been lower truck, rail, air, and water freight transportation costs. Freight transportation costs are lower because:

Economic deregulation and the subsequent restructuring of the freight transportation industry in the 1980s triggered strong competition and lower shipping prices;

Public sector investment in the Interstate highway system in the 1980s and early 1990s reduced travel time and improved trip reliability for motor carriers; and

Adoption of new technologies such as intermodal freight containers, computers and related information technologies, bar coding, radio-frequency-identification tags, and satellite communications by shippers and carriers significantly improved the productivity and reliability of freight operations.”¹²

¹¹ <http://www.fhwa.dot.gov/policy/otps/bottlenecks/images/fig2.1.gif> [February 28, 2007]

¹² <http://www.fhwa.dot.gov/policy/otps/bottlenecks/chap2.htm> [February 28, 2007]

The Key Questions

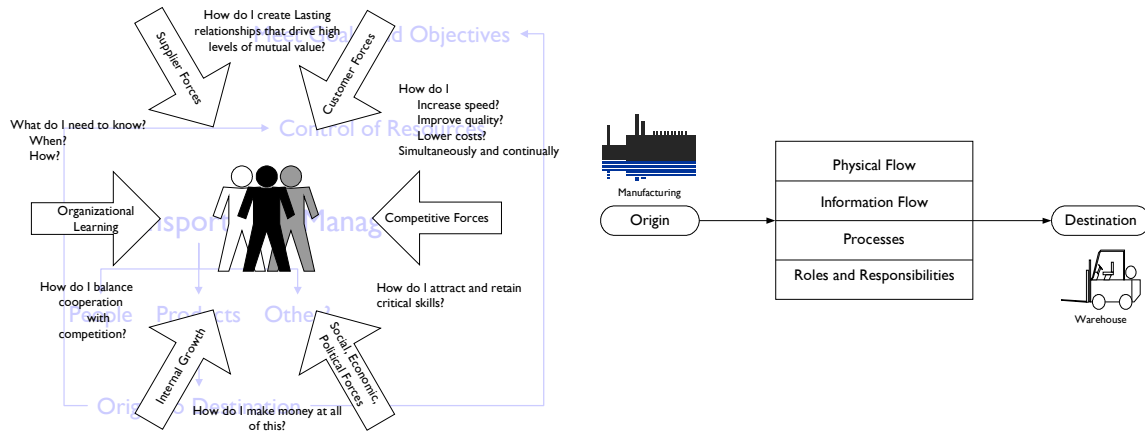


Figure 8 Business Drivers and Critical Questions; Themes

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