To the Graduate Council:

I am submitting herewith a dissertation written by Karl B. Manrodt entitled "Service Response Logistics: A Comparative Analysis of Financial, Health Care, and Contract Logistics Organizations." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment in the requirements for the degree of Doctor of Philosophy in Business Administration.

C. John Langley, Jr.,
Major Professor

We have read this dissertation
and recommend its acceptance:

Accepted for the Council:

Associate Vice Chancellor and
Dean of The Graduate School

SERVICE RESPONSE LOGISTICS:

A CASE STUDY OF FINANCIAL, HEALTH CARE, AND CONTRACT LOGISTICS ORGANIZATIONS

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

KARL B. MANRODT

December, 1993

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DEDICATION

Prasie the Lord! O give thanks unto the Lord for He is good; For His lovingkindness is everlasting.

Psalm 106:1

To my wife Susan, and our daughter Katherine Lynn. Both have added to my joy, and provided the support and encouragement necessary to achieve this goal.

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Education is seldom limited to four walls and a chalkboard. Education occurs during a meal, out on a camping trip, or those quiet nights at home. It is often seen, and not heard. In this area, I have had the opportunity to be educated by my parents. They instilled in me an appreciation of learning, and a desire to improve myself for God's glory. They have been a constant source of encouragement, and love. For that I offer my thanks and love.

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ABSTRACT

Logistics has faced tremendous change throughout the last four decades. During this time the focus of the organization has moved from controlling internal factors to focusing on the final customer. Logistics has become critical in effectively and efficiently achieving this goal.

Early in the 1990's a study commissioned by the Council of Logistics Management was done suggesting that logistics should no longer be bound to the delivery of a product Rather, logistics is critical in the benefit delivery process, whether a product is involved in the process or not. The term "service response logistics" resulted from this effort, and was defined as the management of responsive activities.

The purpose of this exploratory research was to answer three basic questions. First, in a dynamic market, how do firms before more responsive to the needs of individual customers? Second, as organizations become more responsive, internal functions become more important The problem then is how these support services are defined, and how they constrain or expand the firm's ability to adapt to customer requests. Finally, how are these internal functions integrated and coordinated to effectively deliver the requested benefits to the customer?

The research focused on three industries: the foreign exchange process in a large wholesale bank, contract logistics, and health care. While

these three industries have many differences, a general model illustrating how activities can be coordinated was developed. This model suggests that in order to be responsive to the needs of individual customers, organizations must diagnose the customers needs, develop solutions, and deliver the benefit as requested. Diagnosis and solution development are normally done by an employee, while the delivery of the benefit can be accomplished by either internal or external providers.

The research also suggests that the interaction of the physical involvement of the customer in the benefit delivery process and the benefit delivery complexity warrants further research.

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CHAPTER 1

INTRODUCTION

The Changing Role of Logistics

The field of business logistics has experienced dramatic change over the last five decades. While the scope of the field has continually expanded, the core understanding of logistics as focusing on physical distribution did not change until the last few years.

During the 1960's, the field of physical distribution management was considered to "be the other half of marketing." This meant that:

> The field of physical distribution, therefore, revolves around the selection of the number of plants and their locations, the determination of the number, size and geographic arrangement of warehouse facilities and the choice of transportation methods employed. The object is to maximize both short and long run profit opportunities of the firm.[1]

The overriding emphasis was placed on product management and the information needed to carry out this plan efficiently.

During the 1970's, a variety of names were given to the process of distribution, including "physical distribution, physical distribution systems,

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[1]Smykay, Edward W., Donald J. Bowersox and Frank H. Mossman *Physical Distribution Management* (The Macmillan Co.: New York) 1961, p. 4.

distribution engineering, marketing logistics, business logistics, ..."[2] During this time period, physical distribution was the term most used by top management to describe the concept.[3]

By 1976 the term "physical distribution management" was defined by the National Council of Physical Distribution Management (NCPDM) as:

> . . . the term describing the integration of two or more activities for the purpose of planning, implementing and controlling the efficient flow of raw materials, in-process inventory and finished goods from point-of-origin to point-of-consumption. These activities may include, but are not limited to, customer service, demand forecasting, distribution communications, inventory control, material handling, order processing, parts and service support, plant and warehouse site selection, procurement, packaging, return goods handling, salvage and scrap disposal, traffic and transportation, and warehousing and storage.[4]

In practice, physical distribution management was more narrow. A survey conducted in 1975 revealed that seventy percent of the respondents indicated "that the four areas of warehousing-inventory control, materials

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[2]Lambert, Douglas and James Stock *Strategic Physical Distribution Management* 3rd Edition (Irwin: Homewood, Il) 1982, pp. 8-9.

[3]Gecowets, George "Physical Distribution Management," *Defense Transportation Journal 35* No. 4, August 1979, p. 11.

[4]National Council of Physical Distribution Management, *NCPDM Comment 9*, No. 6 November-December 1976, pp. 4-5.

handling, transportation and the order related communications are the functions encompassed in the physical distribution system."[5]

A conceptual definition of logistics was offered by the Society of Logistics Engineers (SOLE) in August of 1974. SOLE defined logistics as:

> The art and science of management, engineering, and technical activities concerned with requirements, design, and supplying and maintaining resources to support objectives, plans and operations.[6]

These definitions of logistics were more restricted than the origin of the discipline, military logistics. For the military, logistics is not only involved in the physical distribution and supply of materials, but also in the acquisition of services for military personnel. According to a NATO glossary of military terms, logistics is:

> The science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, those aspects of military operations which deal with:
> a. design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposition of material;
> b. movement, evacuation, and hospitalization of personnel;
> c. acquisition or construction, maintenance, operations, and disposition of facilities; and
> d. acquisition or furnishing of services.[7]

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[5]Bates, D. L. and John E. Dillard, Jr. "Physical Distribution: Current Application of Theory" *Transportation Journal* Vol. 15 No. 2, 1975, pp. 28-30.

[6]Blanchard, Benjamin *Logistics Engineering and Management* (Prentice-Hall: Englewood Cliffs) 1986, p. 4.

[7]*North Atlantic Treaty Organization Military Agency for Standardization (MAS)* MAS (TC) 58 - AAP-6/1, 2 April/avril 1984, pp. 2-94.

The changes in the definition of logistics have continued into the 1990's. The Council of Logistics Management's most recent definition reads:

> Logistics is the process of planning, implementing and controlling the efficient, effective flow and storage of goods, services and related information from point of origin to point of consumption for the purpose of conforming to customer requirements.[8]

Two changes should be noted in this definition. First, it illustrates that providing services effectively and efficiently to the customer is part of the field of logistics. And second, it emphasizes the importance of information in the delivery process.

These changes in logistics mirror the dynamics of the business environment over the past few decades. Customers are no longer seeking generic solutions to their problems but are demanding, and receiving, specialized products and services to meet their individual needs.

Manufacturers are responding by becoming more flexible and concentrating on "synchronizing production in proportion to customer demand."[9] This requires a flexible manufacturing system (FMS). The goal of an FMS is to create plastic production systems that allow the manufacturer to produce just about anything to small market niches. By

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[8]"What It's All About" Council of Logistics Management, Oak Brook, Illinois, 1991, p. 2.

[9]Stewart, Thomas A., "Brace For Japan's Hot New Strategy" *Fortune* Vol. 126 No. 6, September 21, 1992, pp. 62-74.

concentrating on economies of scope, and not economies of scale, firms can charge higher prices for customized outputs.

An excellent example of this concentration on economies of scope can be found at Toshiba. Toshiba has the capability to manufacture twenty varieties of laptops on a single assembly line, in lot sizes as small as ten. The next goal for the company is to "ship small lots fast and cheaply, with quicker feedback from stores, so sales and distribution are as flexible as the factories."[10]

The flexible manufacturing approach highlights the need for organizations to respond to the request of customers. These requests may take the form of a product such as a laptop computer or a service such as health care. The process of delivering these products and services is the central concern of "service response logistics."

In a study commissioned by the Council of Logistics Management (CLM) in 1990, logistics was classified into two different but overlapping fields: supply chain logistics and service response logistics. Supply chain logistics is the "traditional process associated with the acquisition and distribution of goods", while service response logistics is "the process of coordinating nonmaterial activities necessary to the fulfillment of the service in a cost- and customer service-effective way."[11] Simply put, service

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[10]Ibid., p. 64.

[11]Arthur D. Little and The Pennsylvania State University, *Logistics in Service Industries*, (Council of Logistics Management: Oak Brook IL), 1991, pp. xxi - xxii.

response logistics can be defined as "the management of activities that respond to individual customer requests."[12]

Implicit in this second definition of service response logistics is the idea that the logistics concept is not confined to organizations that produce a product in order to meet the needs of customers. Rather, logistics has been broadened to also include service organizations.

This ability to respond to an individual customer is growing in importance. Responsiveness for a bank customer means fast solutions to financial issues and a willingness of an institution to "go the extra mile" to resolve problems. One study suggests that a firm's ability to respond to individual customers offers one of the highest improvement potentials in the area of customer satisfaction.[13]

The need to respond to individual customers, rather than market segments, has placed new pressures on traditional firms. In the past, firms could plan, implement, and control the processes that delivered benefits to the customer. Individualized service eliminates the ability of the firm to fully control the process. Firms instead must work at scheduling capacity,

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[12]Davis Jr., Frank W. and Karl B. Manrodt, "Teaching Service Response Logistics" *Towards Integration of the Logistics Pipeline, Proceedings of the Teachers Conference*, The Transportation and Logistics Research Fund and The Ohio State University, September 29, 1991, New Orleans LA, pp. 47-77.

[13]*1992 National Consumer Study on Service Quality in Banking* (Quality Focus Institute: Chicago, IL), 1992, pp. 3, 14.

diagnosing needs, developing solutions specific to the customer's needs, and coordinating the delivery processes.

This philosophy is demonstrated in software developed by the Boston Consulting Group and used by Bradys, a San Diego clothing firm. "Segment-of-One Marketing" is a software package that tracks each client's buying habits and preferences. Salespersons, as well as anyone else buying for the customer, have access to the data. This allows Bradys to reduce the time it takes in determining the needs of the customer, or diagnosis, develop specific solutions for the customer, and better coordinate the delivery.[14]

This philosophy can be illustrated by studying Federal Express. Individual customers can obtain very specific information as to when their package was picked up, when it was delivered, who signed for the package, or exactly where it is en-route. Today's customers are not concerned with how long it takes the average package to be delivered, or that ninety nine of the all packages arrive on time. Customers are simply concerned with their package.

This illustrates the view that in order to be effective and efficient, the delivery process of yesterday is no longer applicable. Organizations must develop responsive strategies to compete in a dynamic environment.

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[14]Larson, Jan "A Segment of One," *American Demographics* Vol. 13 No. 12, December 1991, pp. 16-17.

Statement of the Problems

In order to become more responsive to the needs of their customers, organizations must consider new methods to deliver benefits. The delivery of these benefits, whether in the form of products or services, is fast becoming the domain of logistics. The problem facing organizations then is how they can become more responsive to the needs of the individual customers. This study will identify the characteristics that enable firms to become more responsive and will discuss how delivery and support activities are internally integrated and coordinated. This study will focus on answering the following research questions.

Problem 1:

Firms are facing new challenges in a dynamic environment. Organizations may either accept the challenge and change to meet their customers' requests, or face the possibility of losing market share. While many new logistical techniques such as Quick Response programs offer unique solutions to individual channel members, presently there is little research on how organizations can become more responsive to the needs of individual customers.

Problem 2:

Internal functions become more important as firms work to be more responsive to the needs of individual customers. A front-line employee may want to respond to a customer's request but is constrained by the ability of the support services to meet the customer's need. For instance, an airplane turnaround time is limited by the ground crew's ability to re-fuel, re-stock, and clean the aircraft.

Problem 3:

To be more responsive to the needs of customers, the organization must also focus on the internal activities that coordinate the delivery of benefits to the customer. The ability to coordinate these activities responsively depends on the information available within the organization. The enabling role of technology and information increases in importance and either constrains or expands the organization's ability to adapt to changing customer requests. This research will also focus on how an organization must integrate and coordinate the diverse activities of the support services to meet the needs of the customer, and the role of logistics in the coordination and integration of these duties.

While the three problems sound similar, each focuses on a distinct perspective of the organization. The first problem stated above is concerned

with the process that organizations use to become more flexible and responsive. The second problem addresses the technical and informational perspectives required for responsive management. The third problem centers on the need to integrate and coordinate the internal functions of the organization to meet an individual customer's requests.

The integration referred to in Problem 3 means that both supply chain logistics and service response logistics must be working together to deliver benefits effectively to the individual customer. The ability to respond to the customer is limited by the supply chain's capacity to manage variation in the delivery process. How organizations successfully combine the elements of these two areas is fundamental to their long term success.

To answer these problems, case studies utilizing in-depth interviews will be conducted with top executives and managers from various firms. The interviews focused on six major categories that affect the responsiveness of the organization. These six areas are:

1. Front-line employees' interaction with the customer.
2. The relationship between support services and the front line.
3. The role and composition of support services.
4. Technology management used to improve the customer - company interaction.
5. The role of information in the organization.

6. The relationship between support services and outside partnerships.

Contributions of the Research

The main contribution of this dissertation is the further expansion of the role of logistics in both product-oriented and service-oriented firms. Logistics should no longer be limited to managing the supply chain, but should also include the integration and coordination of responsive activities. Rather, logistics should be considered as a fundamental part in the benefit delivery process, whether a product is involved or not. Broadening the scope of these concepts will aid managers and researchers in the continuing effort to increase competitiveness.

The second contribution is the development of a framework with which to study service response logistics. By reviewing the practices of several responsive organizations, future researchers will have a starting point from which to develop additional research.

The third contribution is the identification of practical and specific techniques used by responsive firms. Although the general applicability of these techniques is uncertain, this project does identify possibilities for others in these industries to explore.

The fourth contribution of this dissertation is the identification of how the areas of service response logistics and supply chain logistics must work in concert to meet the needs of individual customers.

Key Assumptions and Limitations

The basic assumption of this research is that logistics is no longer constrained to a functional area, nor is it merely a group of tools to solve problems. Rather, logistics is more appropriately considered to be the integration and coordination of an organization's activities.

The second assumption is the desire on the part of managers to improve their firms' ability to respond to each individual customer. Although this may seem obvious, the recent business history of the U.S. would indicate otherwise.

The main limitations of this project is the lack of demonstrated generalizability. The small sample size and the lack of other in-depth research into the importance of support services or responsiveness preclude readers from applying the conclusions automatically to all industries. Considering the exploratory nature of this research, the lack of generalizability is acceptable.

Outline of the Dissertation

This dissertation consists of eight chapters: Introduction, Literature Review, Research Methodology, Model Development, Roadway Logistics Systems, Union Bank of Switzerland, Logistics in Health Care, and Research Findings and Analysis.

The Literature Review first will describe the evolutionary foundation of service response logistics. Relevant literature is drawn from the topics of Quick Response, service response logistics, and the role of support services in organizations.

The Research Methodology chapter lists the research objectives, research questions, the methodology, and the participants of the study. It also documents the hypotheses, as well as the questions asked in the interviews.

In Chapter Four, Model Development, a conceptual model is developed illustrating how organizations interact with their customers. This model draws on literature from strategic management and logistics, as well as case analyses on approaches used by firms to interact with their customers.

The next three chapters will provide case studies in three different industries. Chapter 5 discusses contract logistics as practiced by Roadway Logistics Systems. Chapter 6 reviews the foreign exchange at the Union

Bank of Switzerland, a major international wholesale bank. Chapter 7 discusses the logistical processes evidenced in health care.

The final chapter, Analysis and Future Research presents the findings of the interviews. The propositions presented in Chapter 3 are documented and reviewed. Refinements to the conceptual model is also discussed. Implications and future research will also be suggested.

CHAPTER 2

LITERATURE REVIEW

Introduction

The purpose of this chapter is to identify common traits in two distinct streams of research that complement the study of service response logistics, and to present a review of literature on service response logistics. These two streams of research are Quick Response and support services. Quick Response studies emphasize the importance of customer requirements in establishing standards for the logistics and marketing distribution channel. The study of support services emphasizes the role of support functions in the organization and how improvements can be made in the delivery process.

In order to fully appreciate the literature and the evolution that business logistics has undergone over the past several decades, this chapter will start with a historic perspective of logistics. The next sections describe the literature comprising Quick Response, service response logistics, and support services.

The Evolution to Service Response Logistics[1]

Logistics is facing dramatic change. New technology is reshaping the relationship between the customer and the organization. Many transactions that once required personal interaction can now be done electronically with little human involvement. This technology has made customers increasingly sophisticated as to what products and services they can and should expect. Now that customers expect to be freed from the hassle of routine interactions with the supplier, they demand complete involvement of the front-line personnel when they have a non-routine problem requiring specialized knowledge or skills.

How have these changes affected logistics? What were the fundamental events that have led to the need for the organization to become responsive to the needs of each individual customer? The purpose of this chapter is to explore these issues and to trace the development of service response logistics, which studies the management of responsive activities within the organization. This will be accomplished first by illustrating the historical trend towards responsiveness and by discussing three of the foundational concepts in service response logistics.

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[1]This section served as the foundation for the following article: Manrodt, Karl B. and Frank W. Davis, Jr. "The Evolution to Service Response Logistics" *International Journal of Physical Distribution & Materials Management*, Forthcoming, 1994.

The Total Cost Concept

The total cost concept was first proposed by Howard T. Lewis, James W. Culliton, and Jack D. Steele in their article "The Role of Air Freight in Physical Distribution" in 1956.[2] The goal was to minimize the total cost associated with physical distribution, or the delivery process, not the individual costs that comprised the total. In this case, delivery costs consisted of trade-offs in many different areas, including warehousing, transportation, inventory carrying costs, and customer service. Using the total cost concept may result in some department or area costs actually being higher than the costs were prior to optimizing the system. For example, a reduction in warehousing costs may be possible, but the savings would be more than offset by increased expenses in transportation costs, thus increasing the total cost. The total cost concept redirects attention from a single function or even a single delivery and focuses on minimizing delivery costs for the entire firm.

The focus of the organization during the years following the introduction of the total cost concept was to control costs internally, as this was the primary method of competition. Whatever the firm produced would be purchased by customers. As customers became more sophisticated, organizations realized that it was not enough to deliver the product to the next customer, either retailer or wholesaler, but that the mission was to

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[2]Lewis, Howard T., James W. Culliton, and Jack D. Steele *The Role of Air Freight in Physical Distribution,* (Harvard Business School: Boston), 1956.

deliver the product to the final consumer. Logistics was viewed as managing a distribution channel consisting of multiple factors that competed in delivering products to the final consumer. The channel captain coordinated the team of producers, carriers, wholesaler, and retailers who made up the delivery system.

The Systems Concept

During the dynamic 1970's, logistics professionals realized that it was not sufficient to develop the best system for delivering products to the final customer. Interest rate fluctuations, inflation, the oil embargo, and other variables made logistics activities more cost sensitive. This forced logisticians to develop dynamic delivery systems that could change in response to changing conditions.

In order to become flexible, companies had to restructure their physical distribution system. Companies such as Whirlpool and Quaker Oats discovered that customer service levels could be increased, while total distribution costs and interdepartmental conflicts decreased. This expanded vision became known as the systems concept, or integrated logistics.[3]

Using this concept, systems of organizations work in a coordinated effort towards a common goal. Such systems are called channels. A channel of distribution could qualify as a system if it met the following five criteria.

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[3]Lambert, Douglas M. and James R. Stock *Strategic Physical Distribution Management*, (Richard D. Irwin: Homewood IL) 1982, p. 32.

1. There must be a set of cooperating institutions.
2. There must be an objective that transcends individual objectives in the performance of channel activities.
3. The channel involves a sequence of activities; orders flow toward the supplier, products flow toward the market.
4. The channel includes several different types of flows simultaneously.
5. Channel performance increases through central coordination of individual decisions of each channel member.[4]

Just as there were external factors shaping the role of the total cost concept, Lambert and Stock have categorized four reasons for the increased attention given to integrated logistics support. These included a more scientific approach to management, advances in computer technology, importance of distribution in providing increased levels of customer satisfaction, and the potential profit leverage from increased efficiency.[5]

As the vision of logistics expanded, so did the tools and methodologies needed to implement the logistics view. For example, one of the most important catalysts of the systems approach in the late 1970's and early 1980's was the enabling power of the computer. With this newfound

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[4]Schary, Philip B. *Logistics Decisions: Text and Cases,* (Dryden Press: Chicago), 1984, p. 32.

[5]Lambert, Douglas M. and James R. Stock ibid., p. 22.

capability to capture, retain and process information, tools that had been developed before and during the 1950's began to find their way into business practice. These tools included simulation, optimization, and heuristics that required computer systems to provide results in a timely manner.

The need for accurate information remains central to the systems approach.

> Accurate, up-to-date information is vital to effective logistics planning and to supply distribution. It is as important to know where supplies are located as it is to have them physically present.[6]

With time, logisticians began to realize that information was indeed a substitute for inventory. In fact, a Mercer Management Consulting, Inc., study suggests that by the year 2000 logisticians will spend more money on information systems than on inventory.[7]

Even with the systems approach, the company's focus was on how to bring technology into the firm and the distribution channel, with little attention on the individual customer. Internal efficiency was achieved by the introduction of new techniques to integrate and expand the logistics function. It was not until the customer service concept took root that logisticians truly began to look at customers.

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[6]Schoch, B. P. "Principles of Logistics Restated", *Army Logistician*, March-April 1983, p. 37.

[7]Presentation by C. John Langley at the Executive Development Program for Distribution Managers, University of Tennessee, Knoxville, Tennessee, April 26, 1992.

The Customer Service Concept

The third dominant concept that has shaped logistics is the customer service concept. Before 1970, physical distribution was "mechanistic and firm-oriented."[8] Physical distribution tried to provide satisfaction by providing time and place utility to the product. Due to environmental changes, traditional methods of providing customer service through high inventories and field warehouses were being questioned. Emphasis shifted to minimizing inventory stocking levels.

Various definitions of customer service were used during this period. Heskett summarized nine of the most popular definitions in his 1971 article shown here in Figure 2–1. These definitions, ranked roughly in popularity, are more "supplier-oriented" than the later two "customer-oriented" definitions. Heskett suggests that these definitions require "greater measurement and control problems."

In 1976, a study published by the NCPDM charted the practices of firms, and how they dealt with customer service. This landmark study, conducted by LaLonde and Zinszer, found that there were three levels of customer service. They defined customer service as activity driven, a performance level, and as a management philosophy.[9]

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[8]Bartels, Robert *Global Development and Marketing,* (Grid Publishing: Columbus), 1981, p. 77.

[9]LaLonde, Bernard. J. and Paul H. Zinszer *Customer Service: Meaning and Measurement,* (National Council of Physical Distribution Management: Chicago), 1976.

1. The elapsed time between the receipt of an order at the supplier's warehouse and the shipment of the order from the warehouse.

2. The minimum size of order, or limits on the assortment of items in an order which a supplier will accept from its customers.

3. The percentage of items in a supplier's warehouse which might be found to be out-of-stock at any given point of time.

4. The proportion of customer orders filled accurately.

5. The percentage of customers, or volume of customer orders, which describes those who are served (whose orders are delivered) within a certain time period from the receipt of the order at the supplier's warehouse.

6. The percentage of customer orders which can be filled completely upon receipt at a supplier's warehouse.

7. The proportion of goods which arrive at a customer's place of business in saleable condition.

8. The elapsed time between the placement of an order by a customer and the delivery of goods ordered to the customer's place of business.

9. The ease and flexibility with which a customer can place his order.[10]

Figure 2–1
Popular Definitions of Customer Service
Source: Heskett, James "Controlling Customer Logistics Service," *International Journal of Physical Distribution,* 1971.

An activity definition would include the duties or functions of an

[10]Heskett, James "Controlling Customer Logistics Service", *International Journal of Physical Distribution,* Vol. 1 No. 3, 1971, pp. 140-145.

organizational body, such as the Customer Service department. Customer service was viewed as a separate function, and not part of the total management philosophy.

As a performance level, some quantitative methods were used to define the customer service level. An example of this type of definition would be "Deliver ninety nine percent of orders in 10 days." Interestingly, in many cases, customer service levels set by the firms were and are much more stringent than those that would have been set by what the customer needs or wants.

As a management philosophy, customer service is not department specific, or easily measured, but rather the attitude that everyone is involved with and accountable for the satisfaction of customers.

In broader terms, LaLonde and Zinszer defined customer service as:

> ... those activities that occur at the interface between the customer and the corporation which enhance or facilitate the sales and use of the corporation's products or services. Therefore, customer service is all of the things that a manufacturer does for a customer in moving a product from the end of the production line to the customer.[11]

Customer service departments before the 1980's were "reactive" to the customer complaint. Customer service became involved when a shipment

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[11]Ibid., p. 2.

was lost, a product was defective, or a part was out of stock. Considerable expense was incurred to trace and handle these situations.

One of the most dramatic and important changes in customer service thought occurred as the result of deregulation of the transportation industry.[12] Transportation firms were forced to fight for customers, competing on the basis of service as well as cost. Also, customer service was not considered to be an activity, but rather a process. "Customer service is a process for providing significant value-added benefits to the supply chain in a cost-effective way."[13] It could be said that customer service had become "pro-active." Blanding has even suggested that customer service is becoming a legitimate management discipline that is concerned with "customer keeping."[14]

This illustrates the view that customer service in the 1970's and 1980's was reactive and firm oriented. Customer service measures that were customer specific were harder to maintain. The late 1980's moved the concept of customer service towards the development of customer value.

Customer value can be defined as "value that is realized by the customer which justifies the sacrifice made to acquire, use and dispose of a

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[12]LaLonde, Bernard. J. and Martha C. Cooper *Partnership in Providing Customer Service: A Third Party Perspective,* (Council of Logistics Management: Oak Brook, IL), 1989, p. 17.

[13]LaLonde, Bernard J., Martha C. Cooper, and Thomas J. Noordewier *Customer Service: A Management Perspective,* (Council of Logistics Management: Oak Brook, IL), 1988 p. 5.

[14]Blanding, W. "Customer Service Logistics" *Proceedings, The Council of Logistics Management* Vol. I 1986, pp. 361-376.

product/service, in comparison to available alternatives."[15] Customer value takes into account other possible alternatives that are available to the customer, and considers economic as well as non-economic costs in the determination of value.

Logistics creates customer value for its customers in three basic ways: effectiveness, efficiency, and differentiation. Effectiveness is a performance issue, where the firm meets or exceeds the customer's requirements. The organization must also provide the desired product or service in a cost effective manner. Logistics also equips the firm with the ability to uniquely differentiate itself from other competitors.[16]

Summary

The three periods discussed above illustrate the dynamics of logistics. During the first period, emphasis was on total cost, and management focus was on how the firm could reduce internal cost of production and delivery. During the second period, emphasis shifted to system costs where management focus was coordinating activities between organizations within the distribution channel. It was not until the third stage that emphasis

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[15]Carothers, G. Harlan and Michael Adams "Competitive Advantage Through Customer Value" In *Competing Globally Through Customer Value,* Edited by Michael J. Stahl and Gregory M. Bounds, (Quorum Books: New York), 1991, p. 34.

[16]Langley, C. John, and Mary Collins Holcomb "Achieving Customer Value Through Logistics Management" In *Competing Globally Through Customer Value,* Edited by Michael J. Stahl and Gregory M. Bounds, (Quorum Books, New York), 1991, p. 553.

shifted to customer service. Even then, emphasis was on setting internally derived customer service standards for the organization or channel. Service measurements were determined by what the company could do, and not by what the individual customer wanted.

While these approaches may seem old-fashioned today, given the focus on customer service, each was appropriate at the time. The four factors that have changed logistics since the 1980's–the political-legal environment, globalization of business, structural changes in organizations and the explosion of technology–had not yet taken place.[17] The way to compete was on price, and not on service.

An important factor that sped the shift towards service response logistics was the increased use of technology in the organizations. Increased computing power, proliferation of personal computers, and the decline of costs relating to information storage made many optimization and simulation algorithms practical. The initial focus of technology was to manipulate the current system, but it soon became clear that it could have dramatic impacts on customers and provide organizations with the capability and capacity to meet the needs of individual customers, and not merely market segments. Emphasis shifted from using technology to

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[17]Bowersox, Donald J., Patricia J. Daugherty, Cornelia L. Droge, Dale S. Rogers, and Daniel L. Wardlow *Leading Edge Logistics Competitive Positioning of the 1990's* (Council of Logistics Management: Oak Brook, IL) 1989, pp. 12-19.

automate existing systems to enabling the organization to re-engineer the way it does business and interacts with the customer.

This means that providers and customer are shifting from a marketplace orientation to a relationship or partnership orientation. This is one of the many facets of marketing. Instead of producing a product that the organization then attempts to sell to an impersonal marketplace, the organization establishes a relationship based on responsiveness to individual customer needs. Organizational responsiveness earns customer trust, repeat business, and higher profits.

Organizations must develop different strategies to compete in a responsive environment than in a traditional product marketplace environment. A responsive strategy consists of three components. First, organizations must build relationships with customers so the customer will contact the organization first when they have a need. Second, organizations must be structured to effectively and efficiently diagnose customer needs and deliver the desired benefits to the customer. Third, organizations must develop information systems that enable front line employees to build relationships effectively and coordinate delivery of benefits to individual customers. The University of Tennessee's Department of Marketing, Logistics and Transportation has included these concepts as part of their vision statement (see Appendix).

Thus marketing is the process of building relationships with customers, while logistics is responsible for developing the organizations and operational information systems necessary to be responsive. The term "service response logistics" is used to describe this function. The term "response" is used because the organization responds to individual customer requests rather than producing to inventory and selling customers what has already been produced. The term "service" is used to emphasize that the customer wants benefits that may or may not ever take the form of a product. It is the benefits that have value, not a product. The term logistics is used since logistics typically has been the responsive branch of the organization responsible for customizing shipments of orders, military movement and support of troops, facilities, supplies, and services.

Service Response Logistics

The field of service response logistics has just begun to gain momentum in the logistics community. While the field was formally introduced to the Council of Logistics Management's membership at the 1991 Annual meeting, the early conceptual work was undertaken at the University of Tennessee.[18] This work resulted in the publication of three articles, which are summarized below.

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[18]Davis Jr., Frank W. and Karl B. Manrodt "Teaching Service Response Logistics" *Towards Integration of the Logistics Pipeline, Proceedings of the Teachers Conference*, The Transportation and Logistics Research Fund and The Ohio State University, September 29, 1991, New Orleans, LA, pp. 47-77.

Service Logistics: An Introduction

One of the first articles published on the topic of service response logistics appeared in 1991.[19] Not only did this article define service logistics, it also examined its historical underpinnings in a broad context and provided some guiding concepts central to the new field.

According to the authors, service logistics–now considered to be the field of service response logistics–organizations has continually expanded through five different historical eras: from production, to distribution, to marketing, to quality, and finally service.

During the Production Era, management's emphasis was on combining land, labor, and capital to produce a product. Three pivotal concepts–the specialization of labor, the standardization of replacement parts and the assembly line concept–were developed during this era.

As these concepts became more developed, production facilities became more efficient. Factories could produce more than they could sell in the local area.

During the Distribution Era, firms began to send salespersons to the marketplace to sell the product. Channels of distribution were established, using wholesalers and retailers to provide the product to the individual customer.

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[19]Davis, Frank W. and Karl B. Manrodt "Service Logistics: An Introduction", *International Journal of Physical Distribution and & Logistics Management*, Special Issue, Prabir K. Bagchi, Editor, Vol. 21 No. 7, 1991, pp. 2-13.

The Marketing Era began when organizations began to make what the customer wanted, and not what the company had the capacity to produce. During this era the organization had to communicate with the customer, determine what the customer's needs were, and produce a product or service to fill the need.

Finding a customer's need was only one part of the equation when the consumer had several options from which to choose. When offered a choice, customers would choose those items that were reliable and dependable. This established the dawning of the Quality Era, where the emphasis was on producing products that consistently delivered the benefits the customer expected. Juran, Crosby, Deming, and Taguchi developed pivotal ideas that helped shape this era. The central concept of this era was that management must organize to produce products that will be consumed well. What was lacking was management's attention to the idea that customers wanted more than a product; they wanted additional benefits that are not attached to a particular product.

Once organizations realize that customers want benefits and concentrate on the delivery of these benefits, they will move into the final era, the Service Era. Benefits can be delivered by products, or they can be delivered directly. For instance, a homeowner may desire the benefit of having his or her house painted. This benefit can be delivered by selling

the homeowner paint, brushes, and ladders, or by hiring someone to paint the house.

The pivotal concept of this era is that "the value of the benefits delivered, whether by product or directly as a service, is determined by fit."[20] "Fit" is the conformance of benefits to the individual's needs.

Davis and Manrodt next discuss four key concepts to understanding service logistics. The first concept is that organizations can deliver benefits with or without a product. As stated above,

> Service era organizations deliver benefits. The objective of organizational activity is to increase the value of the benefits delivered. Benefit value is determined by fit. Fit is enhanced by organizational responsiveness. Responsiveness is customizing the delivery to the individual customer. Customization implies the development of organizations that can respond to market segments of one.[21]

The second concept suggests that the organization's focus should be on the benefit delivery process, and not on the product design. Accordingly,

> Benefit delivery is an activity. Activities are actions performed by organizations. All activities consist of two stages. In the first stage the individual defines what they will do. In the second stage they actually do it.[22]

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[20]Ibid., p. 7.

[21]Ibid., p. 8.

[22]Ibid., p. 8.

The third concept proposes the development of a dual delivery orientation. When benefits are delivered by products, organizational focus is on planning, implementation, and control. When benefits are delivered in the service mode, emphasis is on capacity planning, diagnosis, prescription, and coordination.

The fourth concept presented by Davis and Manrodt is that response organizations require front-line diagnosis rather than centralized planning. Where activities are predetermined, as with products, organizations can use market research, production line design, and market planning to best execute the delivery. Variation between deliveries does not exist. When activities are responsive, the organization must focus on capacity management and need diagnosis by the front-line workers. Capacity management includes the acquisition of facilities, skills, and tools required by the customer contact person (CCP). Need diagnosis requires training and tools to enable the CCP to respond to diverse customer requests.

This article's major contributions are twofold. First, it made a compelling case for the historic evolution of firms. The environment over the last few decades has changed dramatically, requiring new approaches and paradigms. Second, the article presented the foundation for the field of service response logistics. Logisticians were challenged to broaden their view of the field and to think in terms of benefits to be delivered to the customer, and not just in terms of products.

Teaching Service Response Logistics

The purpose of this article was to present an overview of the field of service response logistics as taught at The University of Tennessee.[23] Service logistics was not new to Tennessee, but served as an integral part of the department's view of logistics. A course in this area was first offered in 1985. The Tennessee vision suggested that logistics consisted of three tracks and three cross-cutting fields as illustrated in Figure 2–2. The three tracts are customer service, transportation management and policy, and service response logistics. The three cross-cutting fields, applicable to all three logistics tracts, are international logistics, total quality management, and information management.

The use of the term "service response logistics" directly resulted from the Council of Logistics Management's study of logistics in service organizations. This project clearly distinguished supply chain logistics as the traditional management of inventory, information and product flows, and service response logistics as the management of capacity and the coordination of service delivery to the customer.[24]

The article addressed nineteen basic concepts taught as Service Response Logistics at the University. The concepts are divided into seven

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[23]Davis Jr., Frank W. and Karl B. Manrodt "Teaching Service Response Logistics", ibid., pp.47-77. This paper also appeared in the *Journal of Business Logistics* Vol. 13 No. 2, 1992, pp. 199-231, as the recipient of the Grosvenor Plowman Award.

[24]Ibid., p. 3.

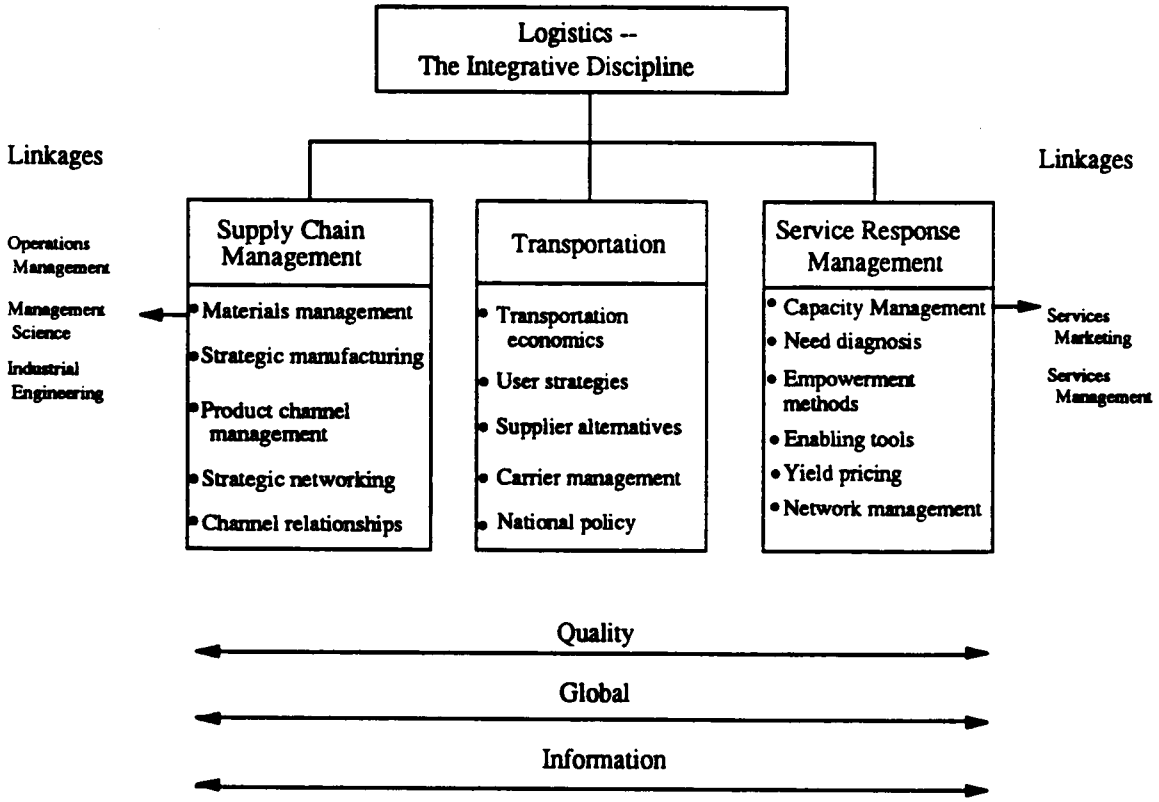


Figure 2–2
University of Tennessee's Vision of Logistics

sections to provide an overview of the course. These seven sections are summarized below.

The first section distinguished between periodic management of activities that support the firm's offering in the marketplace and continuous management of activities that allow responsiveness to individual customer requests. A model of the periodic management approach to managing organizations was compared to the responsive service model to management. Logistics was equated with the management of responsive service activities that respond to individual requests.

Section two described the economics of responsive activities. Responsive activities are managed in the immediate or momentary run as well as in the long and short run. The concept of the immediate run, and its economic principles, is introduced to the students. Key concepts included three–level costing, derived demand, and yield pricing.

Section three described the logistics management mission. Responsive organizations develop ongoing relationships with the customer, diagnose their needs when they call, develop solutions specific to their individual needs, and coordinate delivery. Instead of planning, implementation, and controlling activities by accounting periods, management's job is to enable and empower front-line employees to respond to individual customer requests. Instead of the traditional functional

organization, emphasis shifts to a strategy, tactics, and logistics organizational structure.

Implementation of the logistics management mission requires tools that have a special application for responsive organizations. These tools were presented in section four, and include scoreboard accounting, extended service blueprints, data modeling and information theoretic statistics.

The fifth section described the creation of enabling tools. If organizations are to respond to individual customer needs, front-line employees must have the tools, knowledge and information that enable them to respond during "moments of truth."[25]

Section six recognized that, without a product, organizations must shift attention from a product-offering emphasis to a people emphasis. They must understand how to build relationships with the customer, the employee, and the delivery network.

The final section, section seven, emphasized that service logistics is more than a new "buzz" word. It is a natural continuation of the evolution of society and management.

This article challenged the reader to view logistics as more than a field that manages inventory or transportation, and to focus on the management of an organization's responsive activities. These activities can be either internal or external. Internal refers to how other functions, such

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[25]Albrecht, Karl and Ron Zemke *Service America: Doing Business in the New Economy*, (Dow Jones-Irwin: Homewood, IL), 1985, p. 31.

as Operations, Accounting, Finance, and Marketing, interact and develop solutions for individual customers. External activities refers to how organizations diagnose the needs of customers, and deliver benefits with external suppliers.

This view provides two contributions to logistics. First, logisticians are encouraged to focus on the mission itself, and not just the tactical units used to accomplish that mission. The organization's focus should be on using logistics to better respond to the needs of individual customers.

Second, the article emphasizes the differences between mass production organizations and responsive service organizations. The implication of this contribution is that professional logisticans can play a vital role in service organizations such as health care, banking, and telecommunications.

Principles of Service Response Logistics

While this article helped sharpen the concept and definition of service response logistics, its major contributions were in outlining the paradigms of the field and in presenting nineteen principles of responsive organizations.[26]

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[26]Davis Jr., Frank W. and Karl B. Manrodt "Principles of Service Response Logistics" *Proceeding of the 1991 Annual CLM Conference,* (Council of Logistics Management: Chicago) September 29 - October 2, New Orleans, LA, Vol. 1 pp. 337-356.

The foundation of the responsive paradigms, as found in Figure 2–3, was Taiichi Ohno's work at Toyota.[27] His desire to reduce waste in the manufacturing process was accomplished by becoming more responsive to customer demands.

Ohno believed that waste could be eliminated by reducing unexpected variation. By increasing production's ability to respond, through just-in-time and quick changeovers on the factory floor, Toyota was able to anticipate and respond to the variation.

This required that suppliers be as responsive as the Toyota production process. Cards used to manage the Just-in-Time (JIT) production process, or kanbans, helped schedule the supply of components, reduced inventory, and alerted the supplier as to what products to manufacture. Kanbans were not sent or dispatched until it was certain that demand would not change, thus eliminating excess inventory.

When quantities produced are ordered just in time, product quality must be excellent. There is no room for post-production inspection or storage. This led to the adoption of statistical quality control techniques, which shifted the focus from inspecting the output to measuring and improving the production process.

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[27]Taiichi Ohno *Toyota Production System: Beyond Large-Scale Production*, (Productivity Press: Cambridge), 1988 (English translation), pp. xiv-xv.

1. Organizational responsiveness is limited by unexpected variation.

2. Responsiveness of the primary organization is limited by the responsiveness of tactical units.

3. Organizational responsiveness is limited by work quality.

4. Organizational responsiveness is limited by flexibility of tactical units.

5. Organizational responsiveness is limited by the support organization.

Figure 2–3
Responsive Paradigms

Finally, responsiveness was limited by the ability of the support staff to meet the needs of their internal customers. Engineers and staff were placed close to the manufacturing process, enabling them to assist the workers on the floor effectively and efficiently.

The second major contribution of the article was the introduction of basic principles of responsive organizations. These principles are presented below.

1. Customers want benefits. A product may or may not be involved. The value of the benefits depend upon how well the delivery meets the specific needs of the specific individual.

2. Benefits have value to the customer. Customers pay for benefits, not organizational activity necessary to deliver the benefits. Any activity that does not benefit the customer has no value and is wasteful.

3. Profits are determined by the organization's ability to customize benefits to the needs of each customer. It cost five times as much to attract a new customer as it does to satisfy an existing one.

4. Different customers have different needs. These needs may vary at different times. The depth of the relationship between the customer and the provider is based on the ability of the organization to consistently meet the customer's diverse needs.

5. There are two costs to each delivery. Price and hassle. Price is the economic cost of the product or service. Hassle includes non economic costs such as waiting, uncertainty, disagreements, returning to have the delivery corrected, and having to complain. Hassle is frequently the cost that terminates the customer-provider relationship.

6. Customers interact with customer contact personnel. They are the ones who diagnose customer needs, develop solutions, and coordinate delivery. They determine the value of the benefits delivered.

7. Management's role is to facilitate the customer-customer contact person's relationship. The customer contact person's ability to enhance this relationship is determined by the availability of enabling tools, employee empowerment, delivery monitoring and expert mentoring.

    a. Enabling is done by providing training, facilities and tools. Tools which allow the storage and retrieval of disaggregate data about specific customers and needs are essential. Reengineering is one term currently in use. Enabling tools are event driven and entity based, not flow driven and application based. Emphasis is on storage and selective retrieval of information not inputs and outputs (reports).

    b. Empowering occurs when the customer contact person fully understands that their job is to commit the company to meet the customer's need and to make sure that the delivery is properly made.

    c. Monitoring allows employees and management to track delivery effectiveness and identify fail points for each delivery.

    d. Mentoring is specialized assistance and training given to individual employees on a day by day basis to help them more effectively respond to their customers.

8. Training allows employees to be more things to more people. "More things to more people" means providing more value to more people. That is what customers pay for. Cross training expands the potential customer base and broadens the relationship (cross selling) with each customer. Specialized training strengthens the customer's confidence in the relationship.

9. Responsive organizations use forecasting and continual interaction with the customer to reduce unexpected variation. Unresponsive organizations rigidly adhere to policies, standards, offerings and rules to reduce variation.

10. Responsive activity is triggered by a customer request. Therefore, organizations must be structured to facilitate rapid and diverse responses and to inhibit anticipatory actions which might restrict responsiveness.

11. Responsive organizations develop networks, not systems. Networks, like systems, are composed of many different components. The primary difference is the relationships between the components. Systems are an array of individual elements forming and working as a unit in a prescribed manner. Networks, on the other hand, consist of an array of individual elements which can be interconnected in many different ways on a case-by-case basis. Hospitals, for example, have a network of independent physicians and health care practitioners that can be brought together in an infinite number of ways as required by individual patient needs.

12. Responsive organizations network tactical units. Strategic planning defines the range and depth of skills that should be available to the network. Logistics develops methods for coordinating activities between the tactical units in response to each request. The network of tactical units will include in-house as well as outside partnerships.

13. Individual deliveries are difficult to cost. Organizational capacity can be costed. Once the capacity has been scheduled emphasis should shift from costing to maximizing contribution derived from scheduled capacity. This is called yield pricing.

14. Quality is determined by the customer. Success is delivering the benefits desired by each individual customer. The role of the customer contact person is to diagnose need, develop solutions and coordinate delivery. Management supports this process by developing

enabling tools, empowering workers, monitoring effectiveness and mentoring so that front line personnel can be mo responsive.

15. Marketing is responsible for strengthening the relationship between the customer and the delivery organization. When customers could only be satisfied with products, emphasis was on product planning, promotion, price and distribution. In responsive organizations, marketing is no longer limited to offering products in the marketplace. Marketing has many more options for establishing and building relationships. It should be the champion to continually move the organization to increased responsiveness, and away from rigidity, bureaucracy, and standardization.

16. Accounting provides the information needed to respond to the customer. It is no longer sufficient to provide period end standardized reports. The customer contact person, such as the airline reservationist, needs the information necessary to interact with the customer, strengthen the relationship, and increase organizational yield.

17. Responsive activities occur in the immediate run. Managers must understand the economics of the immediate run as well as long run and short run decision making.

18. Profitability is determined by cost effectiveness. Delivery effectiveness, meeting the individual customer's specific needs, increases revenue. Cost efficiency is accomplished by minimizing the amount of time "waiting on customers" by increasing time spent delivering benefits. This concept goes by various names such as load factors, percent billable hours, daily census, percent deadheading, and room occupancy.

19. Wealth comes not to owners of production factors (landlords, factory owners, capital providers) but to those that have the ability to develop, control, and maintain networks that develop solutions and coordinate delivery.[28]

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[28]Ibid., p. 352-354.

These principles begin to expand the role of logistics, in that customer are more interested in receiving benefits than they are concerned about how those benefits are delivered. The focus of logistics shifts from managing the flow of products, to include the management of responsive activities, which is much broader in definition and scope. This broadening of the field of logistics would suggest that logisticians have much to offer in improving the benefit delivery process.

The article also suggested that cost incurred by the customer should not be limited in only economic terms, but should also consider "hassle," or the non-economic cost of interaction between the customer and the company. Hassle may take the form of waiting in line, arcane rules and procedures, or discourteous front-line employees.

Logistics in Service Industries

The Arthur D. Little / Penn State study was commissioned by CLM in 1990 and studied four different industries–retail banking, field services, telecommunications, and hospitals. The study presented four key findings of the research, which can be found in Figure 2–4. These findings stress the importance of logistics in service-oriented firms, how logistics reduce costs and improve quality, how professional logisticians can transfer their skills

to the service sector, and how the traditional definition of logistics is too narrow.[29]

1. Logistics is a critical success factor for both goods and service industries.
2. Logistics management significantly reduces costs and improves quality.
3. Logistics techniques, skills, and personnel are transferable across both types of industries.
4. The traditional definition of logistics is too narrow to reflect service industry logistics processes.

Figure 2–4
Key Findings
Source: *Logistics in Service Industries,* p. xix-xxi.

According to the researchers, logistics can be divided into two different areas: supply chain logistics and service response logistics. Supply chain logistics is the "traditional process associated with the acquisition and distribution of goods," while service response logistics is "the process of

[29]Arthur D. Little and The Pennsylvania State University *Logistics in Service Industries,* (Council of Logistics Management: Oak Brook, IL), 1991, p. xix.

coordinating nonmaterial activities necessary to the fulfillment of the service in a cost- and customer service-effective way."[30]

Of special interest is Chapter 3, where three major areas of service response logistics are discussed.[31] These three areas are minimizing wait times, managing service capacity, and providing delivery through distribution channels.

Minimizing wait times is often judged to be a key determinant in the quality of service a customer receives from a provider. Wait times can occur in several places, but begin with the introduction of the customer or the customer's request to the network. Wait time in a bank may refer to the time in line waiting for a teller or waiting for a loan application to be processed. Streamlining internal procedures and using advanced technology are two ways that waiting time can be reduced.

The second area for the successful management of the firm is the management of its capacity. Excess capacity increases costs, and insufficient capacity results in lost sales. Capacity constraints range from branch number and location, computer processing capability, vehicle fleet, size and configuration to branch staffing, and customer service representatives. In order to minimize the effect of these constraints, firms

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[30]Ibid., pp. xxi - xxii.

[31]Ibid., p. 33-42.

are sharing resources, cross training personnel and using forecasting techniques to better predict needed capacity.

The third area of success is how the benefits are delivered to the customer. In a bank, branches, ATMs, or electronic banking may provide the customer with the benefits they desire. Each of these methods requires different technologies and skills in the distribution channel. Successful management of this area is related directly to the organization's ability to effective manage the available technology and information.

Of the three areas of service response management, the second, capacity management, is of particular interest to this research. Although the researchers cite several physical constraints on capacity, several internal constraints also should be noted. For instance, while labs (number and location) may be a physical capacity constraint on a hospital, this is only part of the equation. Having a lab at the location does not necessarily mean that capacity is no longer constrained. Lack of equipment or training, scheduling conflicts, or inflexible procedures may also act as constraints on the overall operation of the hospital.

The study concludes by suggesting that logistics must be redefined to include service response logistics. Concepts such as customer service need to be expanded. Finally, the potential cross fertilization between supply chain and service response logistics must be recognized and developed.[32]

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[32]Ibid., p. 192.

Quick Response

A new topic has begun to emerge in the logistics literature, Quick Response. While the Quick Response (QR) concept is commonly found in trade journals and consulting reports, there have been few academic journal articles published dealing exclusively with the topic. This section will focus on the emergence of QR, how QR has been defined in the popular literature, implications of QR, and its implications on service response logistics.

Definitions of Quick Response

There are several definitions of Quick Response, ranging from the specific to the general. Some definitions are listed below:

> Briefly, it (Quick Response) refers to a replenishment technique whereby a vendor resupplies merchandise within a short lead-time based on a retailer's actual rates of sale.[33]
>
> QR is one strategy used to reduce the time needed to move from raw material to point-of-sale in a retail outlet.[34]
>
> Quick Response is a cooperative arrangement between retailers and vendors in which vendors agree to reduce inventory costs and keep fast movers in stock.[35]

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[33]*Responsiveness by Design*, Cleveland Consulting Associates Briefing Summary, Based on a Quick Response program held in Chicago on October 15, 1991, Cleveland Consulting: Cleveland, OH, p. 1.

[34]Weimer, George, Bernie Knill, James Manji and Beverly Beckert "Compressing Time-to-Market: Today's Competitive Edge" *Material Handling Engineering* Vol. 47 No. 4, April 1992, p. IM2-IM16.

[35]Waller, David G. "Gearing Up for Quick Response" *Production & Inventory Management*, Vol. 11 No. 9, September 1991, p. 18.

> Quick Response is less a technology and more an understanding of the way information will be shared using mutually compatible standards, identification schemes, and agreed upon terms.[36]
>
> Quick response is a major cooperative effort between retailers and vendors to increase the accuracy and reduce the response time of shipments and orders.[37]
>
> Quick response (QR) is a strategy of customer service that uses technology to make possible an industry pipeline so flexible and efficient that, ideally, retailers can forecast today what they will sell tomorrow and have the merchandise in the stores on time and in the right quantities, colors, sizes, and styles.[38]
>
> Quick Response is a concept designed to encourage close partnership relations and to establish a standardized approach for sharing information quickly via electronic technology systems and standards.[39]
>
> The quick-response techniques aim for delay-free processing and delivery through every process all the way to the final customer.[40]

Quick Response is normally associated with general merchandisers, while Efficient Consumer Response (ECR) is the term used by the grocery industry. It has been defined as:

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[36]Greene, Alice H. "Getting a Quick Response" *Production & Inventory Management Review & APICS News* Vol. 11 No. 6, June 1991, p. 23.

[37]Anonymous, "Quick Guide to Quick Response (And EDI)" *Chain Store Age Executive* (Section 3), Vol. 66 No. 10, October 1990, pp. 8B-9B.

[38]Anonymous, "Quick Response: What It is; What It's Not" *Chain Store Age Executive* (Section 3), Vol. 67 No. 3, March 1991, pp. 4B-5B.

[39]"Competing for the American Consumer: Partnering for Quick Response" Coopers & Lybrand, 1992, p. 8.

[40]Schonberger, Richard J. *Building a Chain of Customers* (Free Press: New York), 1990, p. 319.

> ... a grocery-industry strategy in which distributors and suppliers are working closely together to bring better value to the grocery consumer. By jointly focusing on the efficiency of the total grocery supply system, rather than the efficiency of individual components, they are reducing total system costs, inventories, and physical assets while improving the consumer's choice of high quality, fresh grocery products."[41]

QR can be viewed as the predecessor of ECR,[42] and for that reason the literature review will focus on QR's emergence and implications for implementation. Also, ECR is industry specific, while QR spans several different industry types.

The Emergence of Quick Response

In many ways, it is the changing environment that has led to the development of Quick Response. Lou Pritchett, formerly with Procter & Gamble, suggests that four factors have led organizations to re-think, reorganize and restructure their operations. They are:

1. Customers today are demanding custom, not generic solutions.
2. Strong supplier / customer relationships and partnerships are replacing "transactional selling."
3. Customers are looking for (and finding) higher-level, different, longer-term relationships with sales and marketing people and the companies these people represent.

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[41]Kurt Salmon Associates *Efficient Consumer Response: Enhancing Consumer Value in the Grocery Industry*, (The Research Department, Food Marketing Institute: Washington, D.C.), 1993, p. 1.

[42]Ibid., pp. 16-20.

4. The "product solution" is no longer what customers are interested in.[43]

Jim Blaser cites five basic factors that contributed to the rise of Quick Response. These five factors are:

1. Traditional trade practices have created an enormous opportunity to reduce costs.
2. Powerful enabling technologies are in place.
3. A few retailers have forced changes in trade practices and levered the results into superior financial performance.
4. A few large-scale suppliers have engineered successful new trade approaches based on Quick Response.
5. Success stories are proving that everybody wins in a QR partnership.[44]

These factors have not only lead to the development of QR, they have also been instrumental in the development of service response logistics. Especially important factors are increased customer sophistication, technological advancements, the move towards partnerships, and the desire for solutions that may not be based in a particular product.

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[43]*Responsiveness by Design*, ibid., p. 9.

[44]Ibid., p. 16.

Implications of Quick Response

In general, Quick Response is a strategy based on improved technology designed to encourage closer relationships between vendors and customers for the reduction of materials in the channel of distribution. This suggests three implications for the advancement of Quick Response.

First, it is a strategy entered into deliberately by both buyers and sellers. QR requires development by a vendor and acceptance by the buyer. In contrast, service response logistics is a philosophy of operating with the customers as they come in contact with the firm.

Second, QR depends on an open partnership or strong relationship between buyer and seller. The adversarial role is no longer appropriate for channel members. Rather, by sharing information, both the buyer and the seller can minimize costs and maximize profits.

Third, the interaction between the buyer and seller must be as smooth as possible. This type of interface has sometimes been referred to as "seamless." The elimination of paper processes and greater reliance on electronic data interchange (EDI) are prerequisites for this seamless transition.

These implications stress some of the important similarities and differences between service response logistics and Quick Response. While

QR is historically more oriented towards product flows, service response logistics may involve either a product or service. This dichotomy is not found in Quick Response programs.

The use of the term "programs" is not careless; many firms implement QR programs, which are not tailored to meet the needs of individual channel members. Some suggest QR programs offered by vendors may not be well suited for the customer's objectives.[45]

Second, QR tends to be externally oriented towards other members within the channel. Service response logistics's focus is not limited to external customers, but applies to internal customers as well.

Quick Response and service response logistics both share in their desire to develop strong relationships or partnerships between customer and supplier, vendor and buyer. These relationships are key in regulating costs and in building responsive, flexible organizations.

In order to do so, technology and information are vital. Not only must information be shared within the functional units of the organization, it must be easily accessible by both vendors and customers. Increased technological advances such as EDI and CASE tools, have made the boundary of the firm permeable and fluid.

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[45]Blaser, James and Bruce Westbrook "Making the Most of Quick Response" *Discount Merchandizer* Vol. 32 No. 5, May 1992, pp. 80-83, 110.

Summary

The literature dealing with the application of Quick Response principles to service response logistics is limited. While QR does focus the organization on responding to the needs of its channel members, it tends to do so by offering generic solutions to unique problems. The goal of service response logistics is to offer unique solutions to customer problems in a cost-effective manner.

Support Services

Most firms today are facing pressure to become more responsive to their customers. Toshiba, a recognized leader in the area of flexible manufacturing systems, is just one example. At a factory in Ome, Japan:

> ..workers assemble nine different word processors on the same line, and, on an adjacent one, 20 varieties of laptop computers. Usually they make a batch of 20 before changing models, but Toshiba can afford lot sizes as small as ten.[46]

The Ome plant is not constrained by suppliers that manufacture components for the different models. Nor are they constrained by the support services that allow the flow of information needed to enable the firm to flexibly manufacture what is needed. The next goal for the organization is to determine ways to ship smaller lot sizes faster and

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[46]Stewart, Thomas A. "Brace For Japan's Hot New Strategy" *Fortune* Vol. 126 No. 6, September 21, 1992, p. 64.

cheaper, with better feedback from retailers. This will allow sales and distribution to become as flexible as the factories.[47]

This example illustrates the importance of support services in an organization. It is support services that allow the firm to carry out its mission and deliver benefits to the customer.

The purpose of this section is to acquaint the reader with current definitions of support services and to demonstrate the potential when managerial and academic attention is focused on better managing the support functions within the organization.

Definitions of Support Services

One problem of studying support services is that a generally accepted definition of the term has yet to appear in the literature. Practitioner journals have concentrated on defining these according to organizational functions incorporating support services. Academic literature has stressed the importance and role of support services in the delivery of benefits to the customer.

This focus on functional units can be observed in practitioner journals from various industries. For some, support services consists of technical field service support,[48] or, in the case of a hospital, support services involve

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[47]Ibid., p. 64.

[48]Cummings, Joanne "GE Unit Offers Outsourcing Service for Enterprise Nets" *Network World* Vol. 9 No. 11, March 16, 1992, p. 25.

laundry, materiel management and other services not in direct contact with the customer.[49] One author suggests that support services in hospitals are becoming increasingly important in determining the hospital's ability to provide patient care.[50] For software manufacturers, support comes in the form of product support, which consists of documentation, hot lines, or training courses.[51] Others have suggested that support functions should not be considered cost functions, but rather as profit centers.

The academic literature discusses the role of support services in delivering benefits to the customer. An example of this can be found in Albrecht and Zemke's *Service America!*.[52] The authors present a model of the service package consisting of three parts. The first part is "service strategy," which defines the organization's business. The second part of the model consists of the "service package," which defines the actual offering made to the customer. For a hotel, the service package would include the room, as well as the morning newspapers, wake-up calls, and the

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[49]Soth, Don G. "Beyond Materiel Management" *Hospital Materiel Management Quarterly*, Vol. 11 No. 1, August 1989, pp. 11-20.

[50]Vaill, Peter "Managing Change in Hospital Support Services" *Hospital Materiel Management Quarterly* Vol. 11 No. 4, May 1990, pp. 6-13.

[51]Blaisdell, Mikael "Support Enters the Twentieth Century" *InforWorld* Vol. 12 No. 41, October 8, 1990, pp. 59-62.

[52]Albrecht, Karl and Ron Zemke *Service America!* (Warner Books: New York), 1985.

availability of an airport shuttle. The third part of the model consists of the "service system," which actually delivers the service to the customer.[53]

The authors further explain the importance of a properly designed service system and provide examples of how a planned system can increase customer satisfaction. When properly planned and implemented, these service systems are not seen or heard by the customer. They are designed with the customer as the focal point, and not for the convenience of the firm.

What is lacking is a generic, yet concise, definition of support services that can be applied across industry and functional boundaries. For the purpose of this dissertation, support services consist of all activities that support the front-line and operations personnel in the delivery of benefits to the customer.[54]

Definition Implications

The implication of this definition is that support services are not constrained to a single function or department within the organization. Rather, support services form the foundation on which the customer–customer contact person dyad rests, and provides the infrastructure needed in the benefit delivery process. The provision of

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[53]Ibid., p. 80-81.

[54]The foundation for this definition was given by Dr. Heinrich Baumann of the Union Bank of Switzerland is a private conversation, March 1992.

facilities, tools, or skills may be internal to the organization, or may be external, ad hoc providers. Logistics not only supports the delivery of benefits in product-oriented firms, but also in service organizations.

Impact of Logistics as a Support Service

A clear precedent from business logistics can be applied to the study of support services today. In the early 1960's, physical distribution and logistics were not generally accepted fields of study, and were given little managerial and academic attention. It was not until managers focused their attention on the topic of physical distribution that the discipline evolved into its present state.

The impetus that began the systematic study of business logistics was Peter Drucker's 1962 article entitled "The Economy's Dark Continent."[55] Here the author concluded, "We know little more about distribution today than Napoleon's contemporaries knew about the interior of Africa."[56]

Drucker suggested that managers were myopic in their concern about costs and were not considering the costs that occur beyond the legal boundaries of the company. Distribution does not end at the loading dock,

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[55]Drucker, Peter "The Economy's Dark Continent" *Fortune* Vol. 65 No. 4, April 1962, p. 103.

[56]Ibid., p. 103.

but continues through the entire channel. Distribution must be "seen and managed as something that crosses legal and organizational boundaries."[57]

Drucker's concluding remarks set the standard by which to judge the effectiveness of logistics. He concluded by writing that the purpose of the article "is to point to distribution as an area where intelligence and hard work can produce substantial results for American business."[58]

How has distribution fared since 1962? Has logistics and transportation become more efficient and effective? Since 1980, nationwide logistics costs have increased each year, to exceed $600 billion per year in the 1990's. These costs include inventory, transportation, shipper- related costs, and distribution costs. However, as a percentage of GNP, the cost of logistics has decreased from a high of approximately fifteen percent to around eleven percent. The net result is over $215 billion saved in increased efficiency and effectiveness in the area of distribution.[59]

Additionally, logistics has been seen as a major force removing many of the traditional barriers between customer and supplier, and buyer and seller. The methods used to remove these barriers include EDI and partnerships, resulting in lower costs for all channel members.

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[57]Ibid., p. 265.

[58]Ibid., p. 270.

[59]Robert D. Delaney, Cass Logistics, Inc., From John Coyle, Edward Bardi and C. John Langley, *The Management of Business Logistics* 5th Edition, (West Publishing: St. Paul), pp. 41-44.

Summary

The purpose of this chapter was to identify the relevant literature impacting service response logistics and to point to new research opportunities for the future. For this review and analysis, three basic conclusions can be drawn.

First, Quick Response illustrates managers' desire to become more responsive to the needs of individual customers. Many of these techniques and applications are used in product-oriented firms at the present time. Managing the supply chain to meet the needs of individual customers is critical in establishing a competitive advantage over competitors. Service response logistics enhances the efforts of Quick Response by focusing on non-product benefits.

Second, the area of service response logistics is an evolving field. This is not surprising, given that the concept was introduced at the Council of Logistics Management's Annual Conference was in 1991. Many of the concepts and principles that will guide the field have yet to be developed. Existing principles must be tested empirically to provide validity for the academic community and future research.

Finally, the area of support services has not been well defined, although the importance of the field has been recognized. Parallels between support services and the development of logistics can be to drawn to illustrate the impact of managerial and academic attention. Additional

research on the area of integrating and coordinating the activities of support services is critical to the development of responsive organizations.

CHAPTER 3

METHODOLOGY

Introduction

Because this research is exploratory in nature, careful consideration was given to the methodology used to explore the area of service response logistics. This section is divided into two parts, the first discussing the case study methodology, and the second describing the theoretical propositions that guide the case study implementation and analysis.

Research Methodology

This section will discuss the rationale of using case studies, its advantages and disadvantages, participants in the research, and how the studies will be implemented.

Use of Case Studies

According to Yin, the method of research depends on the type of question, the control the researcher has over events, and the temporal focus of the research. A case study provides a distinct advantage when the majority of questions focus on "how" or "why," when there is a lack of

control over events, and when the researcher has a contemporary focus of the research.[1]

Several definitions of case studies abound. According to Yin,

A case study is an empirical inquiry that:

- investigates a contemporary phenomenon within its real-life context; when
- the boundaries between phenomenon and context are not clearly evident; and in which
- multiple sources of evidence are used.[2]

A less technical definition is offered by Eisenhardt, who suggests that a "case study is a research strategy which focuses on understanding the dynamics present within single settings."[3] She further suggests that the case study approach is appropriate for developing new topic areas. Bonoma suggests that the points along the "research continuum might be:

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[1]Yin, Robert K. *Case Study Research: Design and Methods* (Sage:Newbury Park) Revised Edition, Vol. 5, 1989, p. 13.

[2]Ibid., p. 23.

[3]Eisenhardt, Kathleen "Building Theories from Case Study Research" *Academy of Management Review* Vol. 14 No. 4, 1989, pp. 532-550.

description, classification, comparison, measurement/estimation, establishing association, and determining cause and effect."[4]

Data Collection

Data collection resulted from semi-structured interviews with top executives, interviews with managers and employees of the firm, secondary sources such as internal documents and industry reports, and direct observation. This methodology is similar to that used in studies in other fields, such as strategic management.[5]

Interviewees may be classified in two ways. The first is as a "respondent," where the researcher asks them facts or opinions concerning various matters. As such, the questions must be fairly well defined and research questions pre-determined. The second classification would view the participant as an "informer," who not only provides additional insight, but also provides alternative means and sources in the data collection process.[6]

Three industries were targeted for study: wholesale banking, contract logistics, and health care providers. This type of nonprobability sampling,

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[4]Bonoma, Thomas V. "Case Research in Marketing: Opportunities, Problems and Process" *Journal of Marketing Research*, Vol. XXII (May 1985), p. 201.

[5]Burgleman, Robert "A Process Model of Internal Corporate Venturing in a Major Diversified Firm" *Administrative Science Quarterly* Vol. 28, 1983, pp. 223-244; Eisenhardt, Kathleen "Making Fast Strategic Decision in High Velocity Environments" *Academy of Management Journal* Vol. 32 No. 3, 1989, pp. 543-576.

[6]Yin, ibid., pp. 88-89.

purposive sampling, is characterized "by the use of judgement and deliberate effort to obtain representative samples by including presumably typical areas or groups in the sample."[7] The Union Bank of Switzerland, with approximately forty percent of its work force in the Division of Logistics, provides an unique perspective as to the role of logistics in service organizations. Contract logistics firms have increased in popularity over the last several years, but little academic research is available suggesting where this industry is headed. Hospitals provide another opportunity to observe how care is coordinated and delivered to the patient.

Data Analysis

Data for the study were gathered primarily by using semi-structured, in-depth interviews. The researcher took notes during the interviews and taped his impressions immediately after each interview. Transcripts of the impressions were prepared and used in the data analysis process.

The data analysis format used will mirror the theoretical propositions provided below. Yin suggests that the case studies should be analyzed in light of the theoretical propositions that guide the data collection process.[8] Each of the propositions will be analyzed for specific content and theoretical implications. Some simple statistical techniques, such as frequency tables

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[7]Kerlinger, Fred N. *Foundations of Behavioral Research* 3rd Edition, Harcourt Brace Jovanovich: Orlando, FL) 1986, p. 120.

[8]Yin, ibid. p. 106.

and bar charts, will be used where appropriate to determine the relevance of certain findings.

The goal of this process is to evaluate the data from as many different angles as possible. This improves the probability of an "accurate and reliable theory," and that the researcher will "capture the novel finds which may exist in the data."[9]

It was fully expected that data collection and data analysis would overlap. Overlapping data analysis with its collection allows the researcher to be more responsive and flexible in the data collection process. One researcher poses the question:

> Is it legitimate to alter and even add data collection methods during a study? For theory-building research, the answer is "yes" because investigators are trying to understand each case individually and in as much depth as is feasible.[10]

How the data collection and data analysis overlapped is illustrated in Figure 3–1. The interviews were guided by the propositions, which were followed by data collection. After each interview, assumptions and potential findings were recorded and often resulted in additional questions being

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[9]Eisenhardt, "Building Theories from Case Study Research," ibid., p. 541.

[10]Ibid., p. 539.

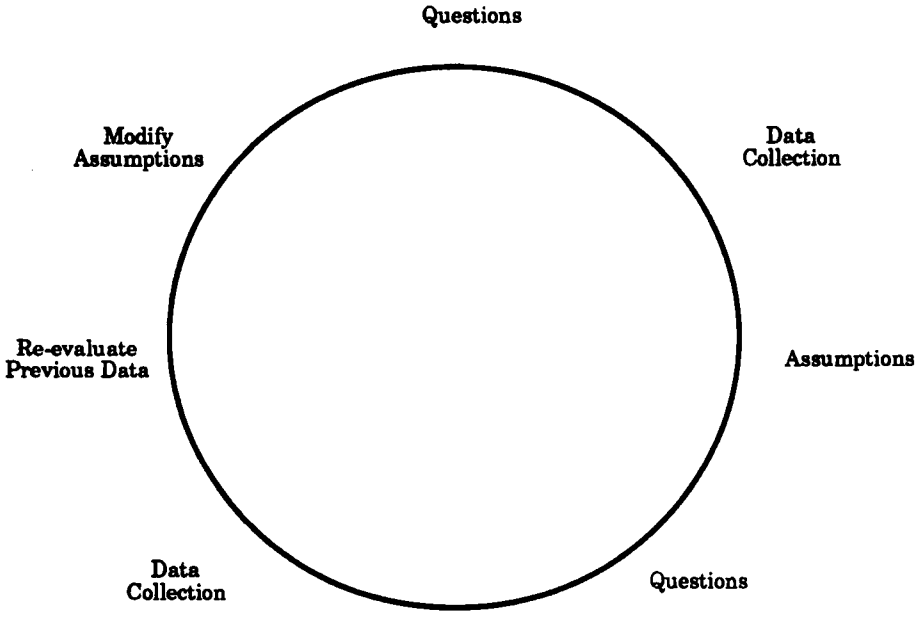


Figure 3–1
Iterative Data Collection Process

asked in the next set of data collection activities. The most recent data were used to re-evaluate the previous data collected and to modify the assumptions that may be drawn from the data. These modified assumptions provided additional questions to be considered.

Conceptual Model and Propositions

Conceptual Model

A conceptual model will be developed illustrating how responsive organizations interact with their customers. This model can be found in Chapter 4. At one end of the continuum are organizations that are fully responsive to individual customer requests, such as consultants or taxi cabs. At the other end of the continuum are firms that offer a single response to the customer. These firms, such as metro bus lines, rely on long-term planning to determine what and how the benefit will be delivered to the customer. The middle section of the continuum is occupied by firms that offer a limited range of products or services that allow them to be moderately responsive. All firms have the potential to be responsive, but in many cases established rules or procedures constrain the customer contact person's ability from delivering the desired benefit.

The conceptual model will be developed in conjunction with the propositions listed below. As such, the research will respond to the following propositions:

Proposition 1: As firms face a dynamic environment, they must become more responsive to the needs and requests of individual customers to remain competitive.

Proposition 1a: Responsiveness includes such activities as a) customized product design, b) disaggregate information systems to provide individualized responses, c) relationship building in preparation of the need to respond, d) standardization of routine transactions and e) more personalized attention to special needs.

The first Proposition suggests that firms change how they manage when the environment becomes more dynamic. As long as economic conditions, customer needs, competitive relationships, and demand levels remain relatively static, firms have the ability to identify markets, plan their responses, and implement their plans as they did in the past. As conditions change, firms must become more responsive to individual customers needs. Proposition 1a identifies some of the dimensions of this type of responsiveness.

Several related research questions to be used in in-depth interviews will include:

- What factors have influenced the organization to become more responsive to individual customer requests?
- How is customer value determined?
- How is relationship quality measured and maintained?
- How is information used to improve the effectiveness of the customer–front-line relationship?
- Is information customized to the user or delivered in a standardized format?

Proposition 2: As firms become more responsive to the needs of individual customers, the role of support service increases in importance.

Proposition 2a: In static markets, the goal of support services is to reduce or maintain internal costs.

Proposition 2b: In dynamic markets, the goal of support services is to enhance flexibility so the organization can respond to its customers' changing needs.

As firms become more responsive, support activities take on new meaning. Order entry, customer service, product customization, industrial partnerships, and many other functions become increasingly important. In static markets, the traditional strategy of identifying markets, planning responses, and implementing a plan while controlling costs is a valid approach. As conditions become more dynamic, emphasis shifts to diagnosing individual needs on a case-by-case basis and building organizations that can respond to special needs.

Some of the research questions to be used to test these propositions include:

- What departments or divisions comprise support services?
- How are support services organized?
- How is technology used to coordinate activities across departmental or divisional functions?
- How important are cost considerations in developing responsive solutions to problems?

Proposition 3: As firms become more responsive, the role of logistics in integrating and coordinating the activities of the support services increases in importance.

Proposition 3a: As firms become more responsive to the needs of individual customers, the role of the customer contact person changes from the management of routine transactions to the management of relationships.

Proposition 3 suggests that dynamic, customized activities depend on the successful integration and coordination of support service activities. These activities may be formalized or routinized by the introduction of technology. An example of this would be an airline reservation system. Other activities will require complete customization for each client, as is the case in wholesale banking. When firms strive to be more responsive to the needs of their individual customers, the customer contact person (CCP) will spend more time diagnosing customer needs and developing a relationship with the client. Less time will be spent on the routine transactions that deliver the benefits to the customer.

The research questions then will focus on the relationship between the support services and the front line. Specifically, they will include questions such as:

- How is the interface between the front line and support services personnel managed to increase responsiveness?

- What roles do support services play in integrating and coordinating different divisions or departments in the organization?
- What is the role of information and technology in building stronger relationships between the CCP and the front line?
- To what degree is the interaction between the CCP and the front line formalized?

Proposition 4: The relationship between the firm and its suppliers moves from an adversarial role to a partnership as the organization endeavors to become more responsive.

Proposition 4 suggests that more responsive organizations assume a different relationship with their supplier. Instead of the traditional buyer-seller role, providers assume a support role where they are always available. This Proposition asserts that little difference exists between the firm serving as a responsive provider to another firm and an internal support group serving as a responsive supporting role to another in-house group.

This Proposition will be explored by comparing how firms manage their partners outside of the boundaries of the firm. These partners may be

regular suppliers, as in the case where raw materials may be needed for the production process, or service providers that are used on an ad hoc basis.

Research question used to test these propositions include:

- As firms become more responsive, do they rely more on industrial partners to provide expertise not found in in-house support services?
- To what degree does the institution rely on in-house support services versus industrial partnerships?
- How is the relationship with these suppliers (or partners) managed to keep them responsive to the company's changing needs?

How these Propositions relate to each other can be seen in Figure 3–2. The first category, signified by the number 1, considers the interaction between the customer contact person and the individual customer. The second category (number 2) refers to the relationship between the customer contact person and support services. What determines the role and composition of support services is the third category of interest. Categories four and five trace the role of technology and information in developing the infrastructure necessary to support the relationship between the customer customers.

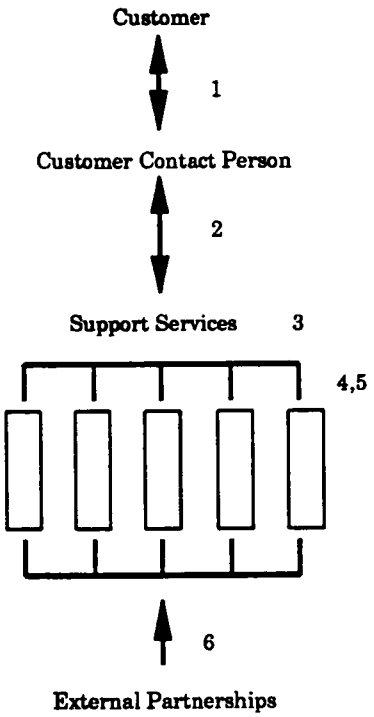


Figure 3–2
A Conceptual Model of the Role of Support Services

and the customer contact person, as well as the relationship between the CCP and internal and external support services. The final category studies the role of external partners in adding needed capacity and capabilities for the organization in order to meet the needs of internal and external

It should be noted that these propositions do not discount the importance of supply chain logistics in delivering benefits to the customer. For organizations manufacturing a product, supply chain logistics is critical. Successful management of the supply chain is a prerequisite for competition in today's global market. Service response logistics can provide these firms a competitive advantage by focusing attention on responding to the needs of the individual customer. For firms providing a service, poor management of supply chain logistics may result in artificial operating constraints. It is the interplay between service response logistics and supply chain logistics that becomes increasingly critical in competitive markets.

This integration can be presented in another manner, using the three components of a product as developed by Kotler and Armstrong.[11] As illustrated in Figure 3–3, the inner component of a product is its core, which are the benefits the consumer hopes will meet their needs. The tangible

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[11]Kotler, Philip and Gail Armstrong *Principles of Marketing* (Prentice-Hall: Englewood Cliffs, NJ) 4th edition, 1989, p. 244. As presented in: Assael, Henry *Marketing Principles & Strategy* (Dryden Press: Chicago) 1990, p. 265.

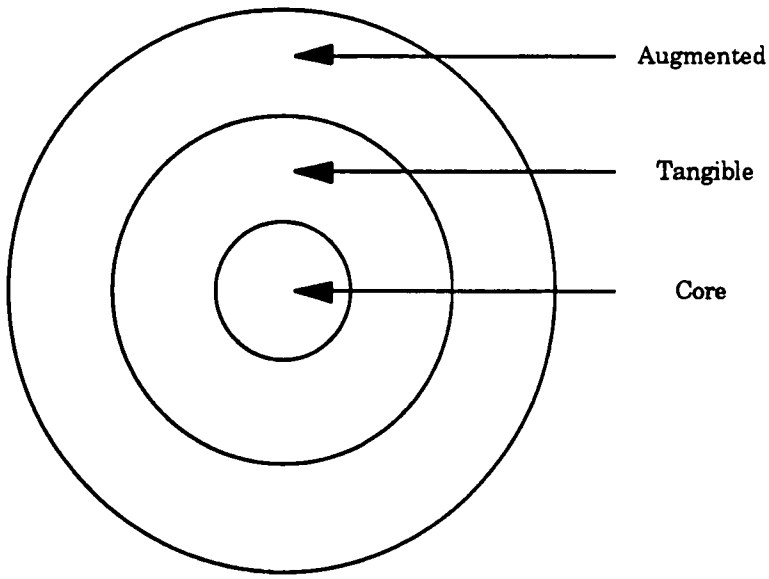


Figure 3–3
Three Components of a Product
Source: Kotler, Philip and Gail Armstrong *Principles of Marketing* (Prentice-Hall: Englewood Cliffs, NJ) 4th edition, 1989, p. 244.

product consists of "attributes representing desired benefits."[12] These physical attributes may include color, brand name, or even packaging. The augmented product consists of post-sale support such as installation, warranties, delivery and other services. From this perspective, a product is a "bundle of attributes and benefits designed to satisfy customer needs."[13]

Logistics plays a key role in supporting and enabling these three product components, as illustrated in Figure 3–4. Materials management is critical to the production process. After the product has been produced, supply chain management is responsive for the distribution of the goods through the channel. Logistics professionals are concerned with availability, costs, distribution, and packaging. The last component, service response logistics, supports the firm's ability to respond to the needs of each individual customer. This comes in the form of delivery, credits, installation, and other services.

The line separating supply chain logistics and service response logistics is not well defined in many instances; the two can overlap significantly.

Figure 3–4 can also apply to service organizations, given a few minor changes. In services, the core benefit is defined by the organization and communicated to the consumer. This benefit may be travel, better health,

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[12]Assael, Henry, ibid., p. 713.

[13]Ibid., p. 265.

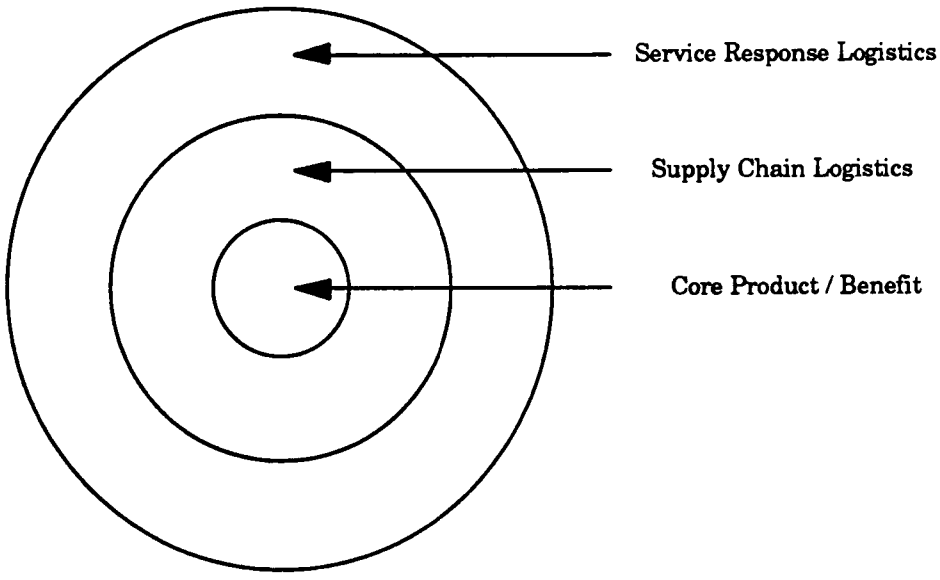


Figure 3–4
Three Components of a
Product as Viewed by Logistics

or education. Supply chain logistics is responsible for delivering the products or materials needed in the delivery process. For a restaurant, this would include meat, vegetables, linen, and other supplies. For an airline, this would include flight schedules and maintenance. For a pure service, such as consulting or banking, the role of supply chain management is supporting the back office, and not delivering the benefit. Service response logistics encompasses the support services needed to deliver the benefits to the individual customer.

Summary

This chapter began with four principle propositions that will guide this research effort. These propositions explore how organizations can become more responsive to the needs of their customers, what activities are important to be responsive, the role of support services and the role of the customer contact person.

Reliance on a single methodology would not provide the needed depth to highlight the integrative aspects of service response logistics, and its interplay with supply chain logistics. Rather, a synthesis of information is needed in order to confirm the propositions. This synthesis includes data from the development of a conceptual model of how organizations respond to individual customers and includes case studies guided by the propositions presented earlier. The result will be a normative model that can be used by

managers in assessing their ability to respond to the needs of individual customer requests.

CHAPTER 4

MODEL DEVELOPMENT

Introduction

Over the last thirty years, business logistics has around the concept that a product must be physically stored and transported from origin to destination. Logistics and transportation added value by providing time and place utility to the product. As discussed in previous chapters, early definitions of logistics, as well as the original name of the professional organization (National Council of Physical Distribution Management), focused on the physical aspects of the process.

Instead of focusing on a product, service response logistics focuses on the management of responsive activities that deliver a benefit to the customer. This benefit may take the form of a standardized product, in which case the product is pre-planned and pre-produced. This would be the case where a standard off-the-shelf product is sufficient to meet the needs of the customers, as is typically the case with package goods. These firms will be referred to as has "product oriented," or "offering based." The benefit may also take the form of a service, such as a haircut or a consulting session with a CPA. In this case, the organization must make available the capacity and capabilities to meet the needs of the customer. These types of

companies can be referred to as "responsive organizations" since they respond to customer requests.

The point of view of these two types of organizations is critical to the actual process used to deliver benefits to the customer. How an organization responds to individual customers is dependent on their objectives, strategy, tactics, and operations. The purpose of this chapter is to describe two models that were employed in this research.

Type of Decisions

Before a discussion of how an organization should normatively organize their support functions and respond to their customers, it will be helpful to review the reasons why a firm exists and the different problems faced as it attempts to meet its objectives or mission. For the purpose of this discussion, we will focus on the work of Igor Ansoff, since it provides a theoretical foundation for discussion of decisions facing an organization.

A primary question for researchers is "Why do businesses exist?" For Ansoff, the term "business" has generally implied

> ... an economically or `money' motivated purposive social organization. This implies a set of objectives or purposes can be identified in most firms, either in explicit form as a part of the firm's business plan, or implicitly through past history and individual motivations of the key personnel.[1]

For these organizations, the measure of success is profit, or the "excess of return over the cost incurred."[2] Costs are incurred during the conversion process of three resources: physical, monetary, and human. Since each of these resources are finite, additional resources must be extracted from the environment to ensure the firm's survival.

Given that firms must extract additional resources from the environment, the overall problem facing the firm is "how to configure and direct the resource conversion process in such a way as to optimize the attainment of the objectives."[3] This broad problem can be divided into three distinct categories, each of which is related to the "total decision space" of the firm. These categories are strategic, administrative, and operating decisions.

Strategic decisions are those "pertaining to the relation between the firm and its environment."[4] They are concerned with external rather than internal problems and address such issues as "what are the firm's objectives

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[1]Ansoff, Igor H. *Corporate Strategy: An Analytic Approach to Business Policy for Growth and Expansion* (McGraw Hill: New York) 1965, pp. 3-4.

[2]Ibid., p. 4.

[3]Ibid., p. 5.

[4]Ibid., p. 5.

and goals; should the firm seek to diversify, in what areas, how vigorously; and how should the firm develop and exploit its present product-market position?"[5]

Another author writes,

> Strategy is the managerial game plan of achieving the chosen objectives. Strategy is mirrored in the pattern of moves and approaches devised by management to produce the desired performance. Strategy is the *how* of pursuing the mission and reaching target objectives.[6]

Each of these definitions refers to objectives. Objectives can be defined as "the quality of the yardstick used to measure the present and future performance of the firm."[7] "Objectives represent the ends which the firm is seeking to attain, while the *strategy is the means to these ends.*"[8] Simply put, objectives are "long term results that an organization seeks to achieve in pursuing its basic mission."[12]

It is at this stage that the organization must define what capabilities and capacity will be needed to compete in the future. Capacity issues may revolve around physical assets, such as plant and equipment, or developing

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[5]Ibid., p. 6.

[6]Thompson Jr., Arthur A. and A. J. Strickland III *Strategy Formulation and Implementation* Fourth Edition, (BPI Irwin: Boston) 1989, p. 19.

[7]Ansoff, Igor H. and Edward J. McDonnel *Implanting Strategic Management* (Prentice Hall: New York) 1990, p. 43.

[8]Ibid., p. 44.

[12]David, Fred R. *Fundamentals of Strategic Management* (Merrill Publishing Company: Columbus, OH) 1986, p. 11.

strategic relationships with partners who already have these assets.[13] Capabilities refer to the training and expertise necessary for the fulfillment of the objectives of the firm. The organization must begin the process of acquiring these skills if it does not already possess them, while effectively managing current operations.

These decisions can be considered "long run, strategic, and definitional" in nature. They are long-run decisions since they have implications that cover multiple accounting periods and are normally the domain of top managers. They are strategic in that they provide a plan of action. They are definitional in that they define how an organization will pursue its mission.

The differences between responsive and offering-based firms become apparent. Production-oriented firms will define not only how the organization will pursue its mission, but exactly how it will interact with the customer. This standardization between customers allows greater control and consistency in the delivery process. Responsive firms define the skills and tools needed to interact with the customer, but allow for greater variation between customers.

The second category of decisions in Ansoff's work is administrative, which is:

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[13]This brings up the concept of developing networks, as opposed to systems, which allow you to dynamically bring together various modules to deliver benefits to the customer. These modules may be warehousing, less-than-truckload (LTL) or truckload (TL) carriage, or express package delivery.

> concerned with structuring the firm's resources in a way which creates a maximum performance potential. One part of the administrative problem is concerned with organization: structuring of authority and responsibility relationships, work flows, information flows, distribution channels and location of facilities. The other part is concerned with acquisition and development of resources: development of raw-material sources, personnel training and development, financing, and acquisition of facilities and equipment.[14]

Administrative decisions focus on the internal and external support services, logistical systems, and networks an organization must develop to respond to the environment. These decisions are concerned with the environment, where the organization will find the needed raw materials for the organization. In other words, administrative decisions must coordinate both the internal and external activities of the firm.

While operational decisions (to be discussed later) may comprise up the bulk of decisions facing the organization, the coordination category has the greatest impact on the profitability and flexibility of the firm. These decisions determine the protocols or procedures that will be used to respond to the customer, as well as the information and material flows that occur within the firm.

In offering-based firms, these protocols are pre-planned and rigid. Coordination done internally and externally is well documented, concrete, and contractual. In responsive organizations, coordination decisions are

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[14]Ibid., Ansoff, 1965, p. 6.

concerned with developing dynamic networks that allow the firm to be more flexible to customer requests. They are fluid and relationship oriented. While there may be specific ways in which some tasks are performed, they are much less routinized.

Coordination decisions are normally the domain of top and middle management. The role of top management is to define what relationships with the environment are important (which suppliers, vendors, customers), and to start the relationship- building process. The role of middle management is to manage the relationship on a continual basis.

Since coordination decisions are made by both top and middle managers, they have both long-run and short-run consequences. The short run can be defined as decisions that affect a single economic period.[15] In offering-based firms, the proportion of coordinating decisions will be predominantly long-run, with fewer short-run decisions. This is due to the desire to plan, implement, and control the process. In responsive organizations, a large proportion of coordinating decisions are short term, with fewer long-run decisions. This allows the responsive organization to be flexible in working with individual customers.

The third category of decisions facing an organization is operating decisions. These decisions attempt to maximize the profitability of the

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[15]Davis, Frank W. and Karl B. Manrodt "Teaching Service Response Logistics," *Towards Integration of the Logistics Pipeline, Proceedings of the Teachers Conference,* The Transportation and Logistics Research Fund and the Ohio State University, September 29, 1991, New Orleans LA, pp. 47-77.

current operation and usually account for the majority of the firm's attention and energy. In fact, Ansoff suggests that operating decisions may be more important to the organization than strategic ones. Operating decisions are concerned with:

> resource allocation (budgeting) among functional areas and product lines, scheduling of operations, monitoring of performance, and applying control actions. The key decisions involve pricing, establishing marketing strategy, setting production schedules and inventory levels, and deciding on relative expenditures in support of R&D, marketing, and operations.[16]

Operating decisions must work within the constraints established by the strategic and administrative decisions. In turn, administrative decisions must work within the strategy of the organization, and the strategy is subservient to the objectives of the organization.

As defined by Ansoff, both administrative and operating decisions occur during the same time period, the short run. This is acceptable when the organization must plan, implement, and control the benefit delivery process. However, it is not advantageous when the organization must interact with the customer to determine what benefits they are to deliver to the customer.

The term "operating decisions" may be used by both responsive and offering-based firms, but it describes different activities. For offering-based

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[16]Ibid., Ansoff, 1965, p. 5.

firms, operating decisions are short-run activities that pre-define the offerings that will be made available to the customer. The offering can either be accepted or rejected by the customer. For instance, a canning company cannot interact with each customer buying a can of peas, so it relies on advertising to sell the product. When the customer does interact with a front-line worker, what the worker says or does is pre-planned to ensure consistency across the organization. Either way, offering-based firms do not respond to customers at this immediate level, but rather follow a plan.

In responsive organizations, the firm must diagnose the needs of the customer, which is usually done during the immediate run. The immediate run consists of those "moments of truth" when a firm and customer come face to face and is primarily the domain of the front-line employee. A customer's individual response cannot be planned, implemented, or controlled. Rather, the employee can only be given a broad set of guidelines or protocols as to how to deliver the benefit to the customer. For instance, a nurse in the emergency room responsible for triage cannot be told not to "sell" any more broken legs since the hospital has already met its quota.

How an organization views the immediate run affects the type of operating, administrative, and strategic decisions it will make. If the immediate run is considered, administrative decisions must support the front line, and provide the necessary infrastructure. Infrastructure may

require more training, or providing the necessary support to mentor and enable the employee. It may become a strategic issue, especially when the firm would need to invest in the appropriate information systems. If the immediate run is ignored or controlled, then management's attention is diverted to strategic and administrative decisions, which do not account for the immediate run.

Summary

The purpose of this section was to provide a basic overview of the three major categories of decisions. Strategic, or definition, decisions revolve around determining what the business of the firm is today, and what it should be tomorrow. These decisions are long-run decisions in that they impact the organization over several accounting time periods. Administrative, or coordination, decisions determine how the firm and the individual will interact with each other. These decisions are determined in the short run. Operation decisions for offering-based firms are largely ignored or pre-planned, while in responsive organizations they focus on the actual interactions with the customer. For offering-based firms, operating decisions occur in the short run, and for responsive firms in the immediate run. These three categories of decisions must be analyzed given the decision's time constraints and demands and its impact on the future of the organization. Each of these decision categories must be linked to maximize

the resource conversion process. A summary of these differences can be found in Figures 4–1 and 4–2.

The ability to be responsive to the needs of the individual customer is a function of how well defined the benefit is prior to customer contact. As top management becomes more involved with coordination and operating decisions, the firm loses its ability to respond more quickly to the needs of individual customers. In other words, variation between customers is best handled at the lowest possible level in the firm, and not at the higher levels of the firm. This is called "customization on contact."

Table 4–1
Comparison of Responsive and Product-Oriented Firms by Type of Decision and Time

	Strategic	Administrative	Operations
Long Run	Product Oriented and Responsive	Product Oriented	Product Oriented
Short Run		Product Oriented and Responsive	Product Oriented
Immediate Run			Responsive

Table 4–2
Summary of the Differences
Between Offering-Based and Responsive Firms

	Production Model	Responsive Model
Long Run	* Focus on what business we are in, and what we should be in * Look at new products to develop to meet large market segments * Strategic alliances or joint ventures to trim costs, and increase competitive advantage. * Are formal agreements	* Same * 1-5 year time horizon * New products or services needed to respond to individual customers * Strategic alliances or joint ventures to develop ad hoc network
Short Run	* Schedule capacity * Review cost allocation * 1-3 year time frame	* Schedule anticipated capacity * Re-allocate on an as-needed basis * Develop customer solutions * Longer, more complex requests will take more time to develop * 1 day to 1 year time frame
Immediate Run	* Is not considered	* Diagnose individual customer requests * Deliver the benefit

Not all firms can interact with their customers in such a way as to allow for customization on contact. Lead times, economic issues, product attributes, or other environmental conditions may make this impossible or impractical. Other times, it is perceived constraints, normally bureaucratic, that hinder the firm's ability to respond to the customer.

This next section will highlight two different methods organizations can respond to their customer. The first is an offering-based model and the second a responsive model.

Offering-Based Model

The production model is based on the premise that a standardized product or offering is made available to meet the needs of a particular market niche. From a historic perspective, organizations have had little difficulty in selling what they produced, regardless of the fit with the individual customer. As competition increased, and customers became more sophisticated, firms by necessity began to market what they sold. This led to market niches, or market segmentation.[17] The underlying concept of this movement was to better meet the needs of groups of customers by improving the fit between the product and requested benefit. An expanded

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[17]Davis, Jr., Frank W. and Karl B. Manrodt "Service Logistics: An Introduction", *International Journal of Physical Distribution & Logistics Management*, Special Issue, Prabir K. Bagchi, Editor, Vol. 21 No. 7, 1991, pp. 2-13.

discussion of the concept of fit between the customer and the organization, and its impact on quality can be found in the Appendix.

An example of this model can be illustrated by McDonald's restaurants, found in Figure 4–1. McDonald's offers a standardized product to a market niche of customers demanding fast, friendly service, and consistent high quality. Each batch of French fries and hamburgers are cooked the same amount of time, and are usually placed in inventory prior to a customer's order. Big Mac's beef patties are cooked for a specified time, and placed on a sesame seed bun, along with special sauce, tomato, lettuce, cheese, onion and a pickle.

Another facet of McDonald's is how it interacts with the customer. Normally, the interaction between the customer and the organization is kept to a minimum, and the ability of the restaurant to respond to customer requests is difficult. If requested, some of the above ingredients will not be added to the sandwich.

McDonald's is an excellent example of an organization that has achieved success by applying the production model to the fast food market. Having defined their market as "fast food, high quality," their process must match the desires of the market. This is accomplished by minimizing the amount of time the front-line employee interacts with the customer. There is no need to diagnose what the customer wants since a pre-defined menu of consistent quality is on display. No one asks the front-line person,

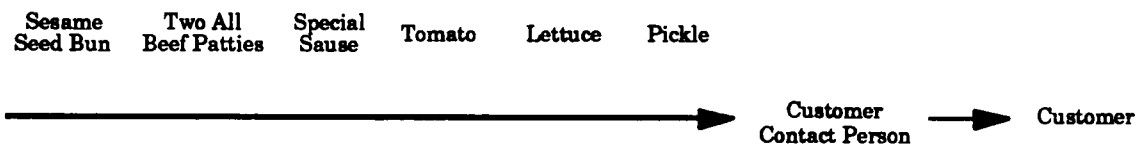


Figure 4–1
Offering-Based Approach

"How are the fries today?" because of McDonald's success at being consistent between stores.

This also means that the information requirements the customer must relay to the organization are minimal. It is merely an order. Advance notice or reservations are not required. McDonald's does not have to know who will be there for lunch; rather, they forecast demand and inventory products to meet the expected demand. As in a classical production process, uncertainty is "covered" by inventory.

The fit between the product offered and the customer's requirements sometimes differ, in some cases resulting in a special order. These requests are hard to handle, in that they disrupt the normal production process. Because these orders take more time and defeat the goal of fast service, many customers may order an item and then make alterations to the product. This may require the customer to remove a pickle or onions. Waiting for the special request is weighed against doing it yourself.

The success of the organization is based on its ability to translate aggregate demands into pre-defined offerings. The focus of the organization is on the market segment as a whole and on developing a solution that will meet the needs of as many people in that segment as possible. The response of the firm to each customer is pre-defined and pre-determined. Individual customer interaction, customer service, and feedback occur only after the product has been made.

This focus on the aggregate market segment is coupled by an internal focus on the production process itself. In order to remain competitive and efficient, waste must be eliminated from the process. Waste can consist of time (customers waiting too long for orders), material (products made and not used within the allotted time span), or personnel (too many people on a particular shift).

This should not suggest that McDonald's is not successful or that their approach is incompatible to the market. Rather, the production model is but one way an organization can compete in the market and serve their customers effectively and efficiently.

Responsive Model

When a standardized product is not sufficient, the desired benefits can only be defined after interacting with the customer. Each customer is different, and each product delivered to the customer is different. In this case the organization must plan the capabilities and capacity required to respond to customers when they call. These types of organizations approach the customer with the query, "How can I help you?"

In contrast to McDonald's, Subway subs are made while the customer and the firm interact with each other (see Figure 4–2). This interaction is critical in diagnosing exactly what the customer wants. Foot-long or six-inch bun? Wheat or white? What type of meat? The role of the front-line

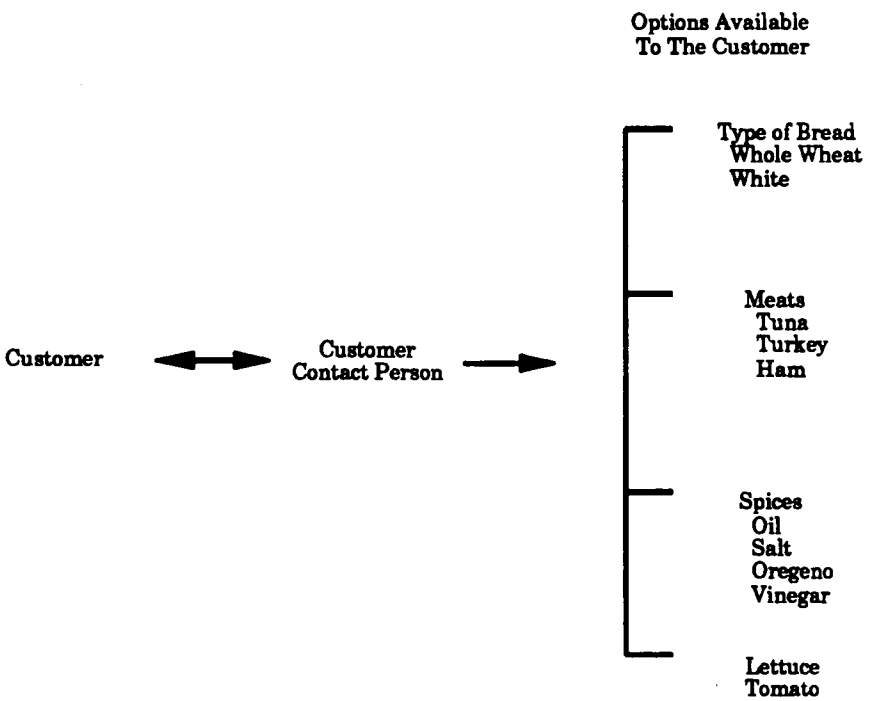


Figure 4–2
Responsive Approach

employee is not limited to writing orders, but also consists of diagnosing the needs of the individual customer.

This process requires that a great deal of information be supplied by the customer as the sandwich is being made. The "sandwich artist" cannot complete the project unless the customer provides the needed information. One of the outcomes of this process is that there is great variation between each customer order. Individual subs cannot be placed in inventory waiting for a customer because each sandwich has the potential of being unique. This variation between and within sandwiches is best managed at the lowest level in the organization.

One of the problems facing a responsive organization is how to manage this range of variation between customers and is one of the major distinctions between the two models. Instead of pre-planning and pre-defining the individual offering, an organization pre-defines and pre-plans the capacity and capabilities it will need to meet the needs of the customer. This consists of asking, "What type of bread should we have, and how much should be on hand?" Production-oriented firms also ask these questions, but also pre-define the response.

Distribution centers, like Subway, respond to individual requests rather than producing to inventory. How the model applies to distributions centers can be found in Figure 4–3. The customer calls the customer contact person who interacts with the customer to determine needs and

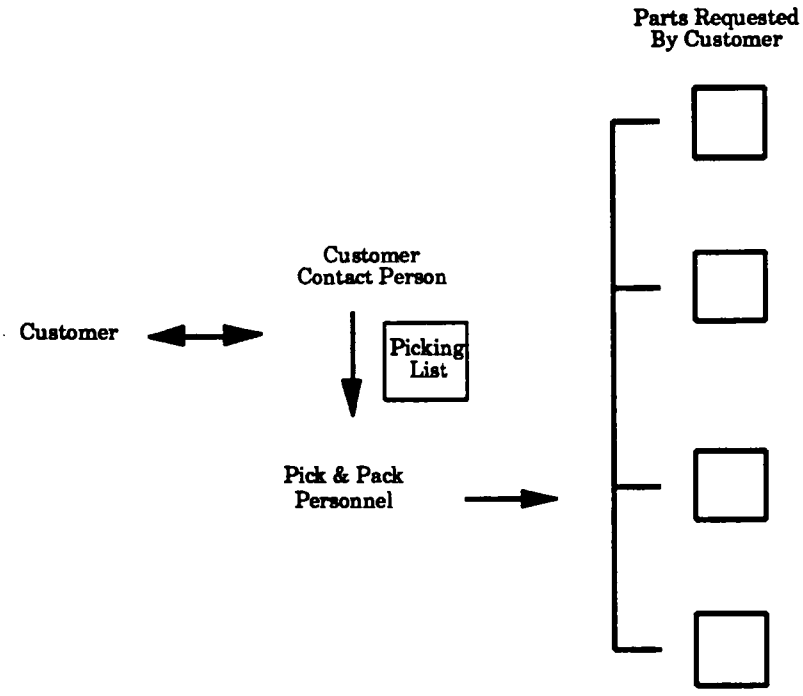


Figure 4–3
Example of a Distribution Center

develops a delivery strategy for that individual customer. The delivery strategy takes the form of a picking list. The picking list is dispatched to the warehouse where the order is selected from inventory; packaged according to order size, shipping method, and customer requirements; and shipped as requested.

The customer contact person (CCP) must coordinate the benefit requested with the ability of the organization to meet these needs. For instance, a customer may request to have a product available for pick-up in twenty minutes, but the distribution center's fastest pick time is one hour.

In some cases, where the interaction ("moments of truth") can be standardized, the organization will use technology to reduce or eliminate CCP involvement to streamline the process. This is likely to occur when the interchange is frequent and standard, with no need on the part of the firm to diagnose the needs of the individual customer.

It is important to note that in all of these cases the organization first establishes some level of capacity or the ability to meet some range of customer requests. In some cases the capacity is rather large, as at a research hospital, while in other cases the skills required are highly specialized, like that of an oral surgeon. In both cases the firm must respond to individual customer requests and manage the capacity in such a way as to maximize utilization of the facilities and employees. How the organization is structured to integrate and coordinate its activities then

becomes paramount. This is true not only when fitting the customer's individual need but also in determining the percent that is sold, and not wasted.

Summary

This section has illustrated that there are two very different ways in which an organization can respond to their customers. In the production model, the response to the individual customer is pre-planned and pre-defined. Demand is forecasted, and little information is requested from the customer. Customization of the product to meet the needs of the individual is difficult, in which cases the customer either may accept the product as is or adapt it themselves.

According to the responsive model, the individual response is not pre-planned or pre-defined; rather, the focus of the organization is on developing the capacity and capabilities necessary to meet the needs of the customer. The organization must diagnose the needs of each customer, thereby customizing each delivery. Fit, the agreement between what the customer requested and what is received, is much higher and a function of the customer contact person's ability to diagnose what the customer wanted.

The next section will continue to build on the responsive model presented and will illustrate how organizations can be viewed from a strategic, administrative, and operational level.

Examples of Responsive Organizations

Not all customer-company interactions are as easily dissected as McDonald's or Subway. In many instances more people are involved in the diagnosis process or in delivering the benefit to the customer. A model describing these interactions should be flexible enough to accommodate these changes.

Figure 4–4 describes a model that divides the transaction into three components: diagnosis, development of the solution, and delivery of the benefit. Each of these three parts will be discussed below.

Diagnosing customer needs is the first stage of the customer-company interface. Diagnosing needs requires the CCP to discover what benefit or benefits the customer is requesting. This may range from being rather simplistic, as at Subway, or rather complex, as in a physician's diagnosis. A few more examples may be helpful.

Consider the role of a travel agent, illustrated in Figure 4–5. An agent has two primary responsibilities: helping diagnose where the person wants to go and developing the solution to meet the customer's individual needs. Each individual's request is unique and based on their time and financial constraints, as well as their desires.

For instance, a couple may wish to tour Europe. If they are a young couple on a limited budget, the agent will suggest a different set of alternatives than a retired couple who are looking for a comprehensive tour,

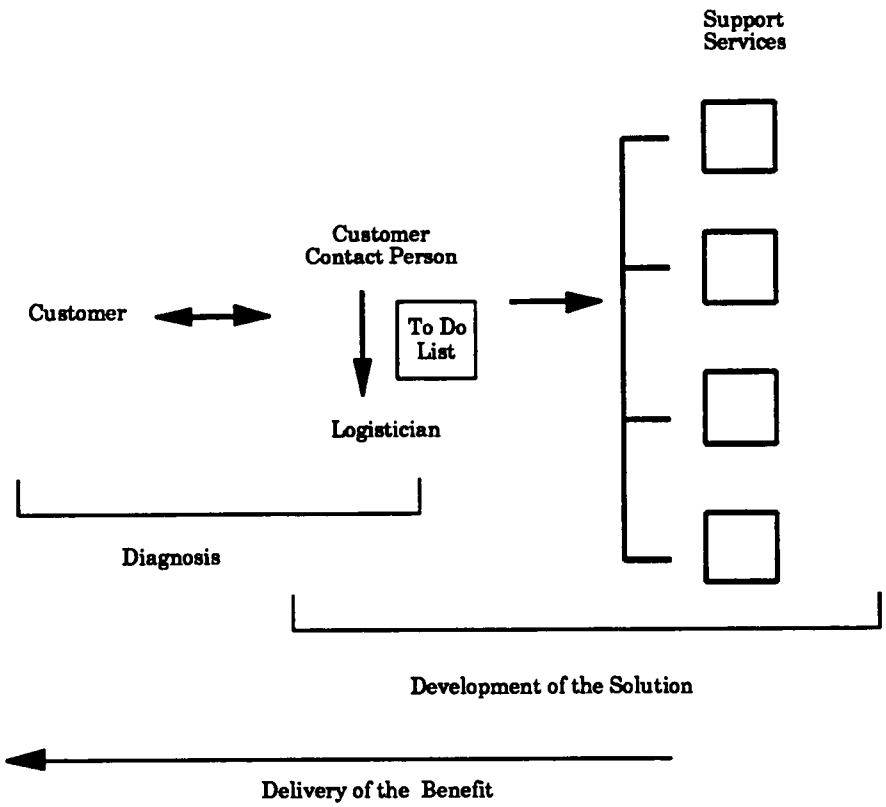


Figure 4–4
Three Components of the Responsive Model

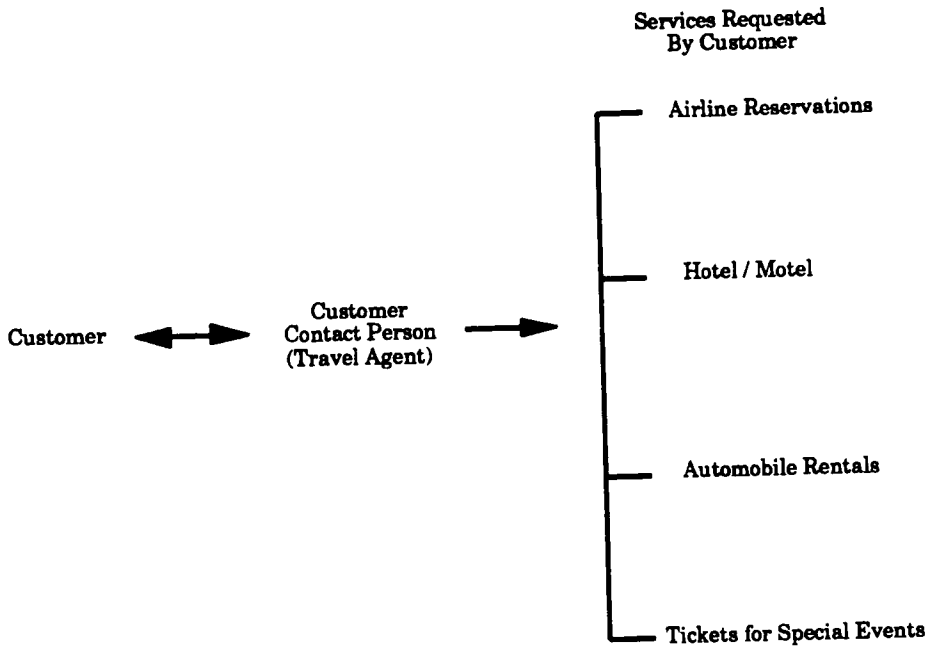


Figure 4–5
Travel Agent as a Responsive Entity

complete with tour guide. In the first instance the agent must develop an itinerary and schedule rooms, flights, ground transportation, and possibly tickets to a local attraction. Capacity of each supplier must be scheduled, and alternative suppliers be considered if capacity is not available. The couple can then review the solution and determine how it fits within their needs. In the second instance the agent selects the best two or three tours for the couple and allows them to make the final choice.

In both instances the travel agent is responsible for accurately diagnosing the customer's needs and tastes and developing a solution that will meet or exceed their expectations. The agent is not present during the delivery process, but will be held accountable for that process by the customer. For this reason the agent must have confidence in the ability of the support services to deliver the benefit.

This need to be personally responsible for the coordination of different activities is also paramount in the health care industry. This model can be found in Figure 4–6. This model will present the most simplistic view of the process; a more in-depth analysis can be found in Chapter 7.

During the diagnosis stage, the physician determines the needs of the patient and evaluates potential treatment methods. In some instances, as in the case of a broken arm, the diagnosis is rather simple. Where the symptoms do not clearly match a specific ailment, there is a need for testing. This may take the form of X-rays, blood tests, MRI, Cat Scan, or

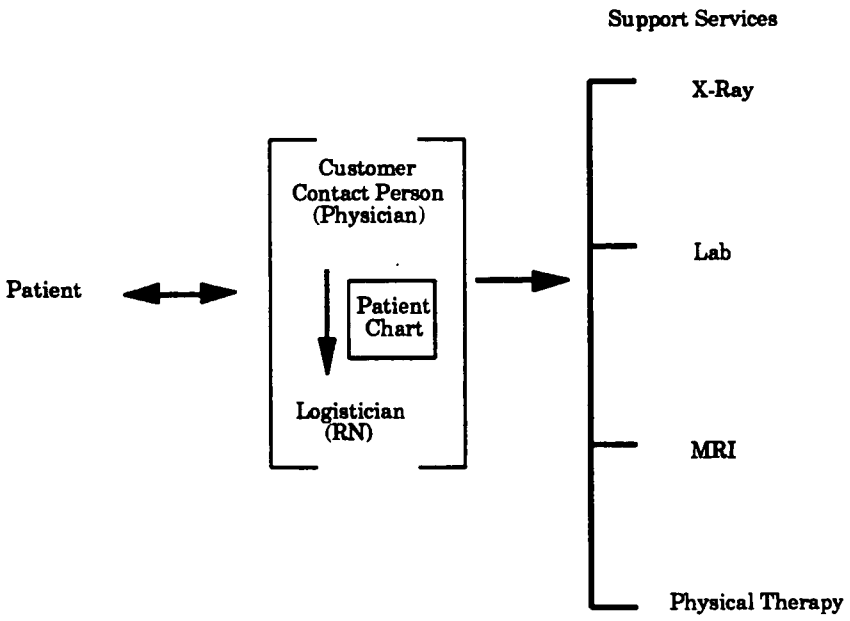


Figure 4–6
Physician as a Responsive Entity

some combination of these.[18]

Tests must be scheduled with the appropriate department. Complexity of the scheduling increases as the number of procedures increases and if the patient is to be physically present. If a single blood sample is taken and sent to the lab, the procedures of the lab do not impact the customer's perception of the process since the customer is not there. However, if the patient must wait an hour before the sample can be drawn, the customer can become increasingly dissatisfied.

Scheduling at the operating level of the organization is the actual process by which the patient will be moved through the organization. The number and type of tests are determined by the physician, and it is the responsibility of the RN to make sure that the patient follows the schedule.

In many cases this process will be focused on managing and coordinating activities internal to the hospital. This is most true for those activities revolving around the patient, and those with direct patient contact with the delivery process. It is less true for those activities that do not require the patient to be present during the delivery process. For instance, the former includes X-ray, and physical therapy, and the latter includes blood samples sent to a lab. When samples are sent out, there is normally a CCP is responsible for gathering all of the samples for the hospital.

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[18]This diagnosis process can be much more complex, especially when there are several attending physicians, which is normally the case for intensive care patients. In that instance the CCP is actually a team of care-providers. This is fully discussed in Chapter 7.

Scheduling the patient's tests at the coordination level is to develop the necessary protocols that fit the initial diagnosis provided by the treating physician. These protocols establish how the patient will be prepped for tests, the sequence the patient will follow, and how the patient will be routed. These protocols are normally established by a case manager or someone else intimate with the delivery process. While it is important for the front-line workers to be involved in the protocol development process, they normally do not have the time to analyze their work flows.

The needs of the patient viewed from the strategic or definitional level revolve around the role of the health care provider in that environment. Administrators ask such questions as: Should the hospital do all of its own tests, or should it outsource? What are the benefits? What tests should they be outsourced to another laboratory? What new technologies or methodologies should the hospital invest in? Do laboratories at other area hospitals have excess capacity that can be utilized?

While the different components that comprise support services for the health care provider can be easily discussed, the infrastructure that enables this coordination to take place is harder to define. A technological infrastructure considers the telecommunications and computer systems that enable the transfer of information. Protocols are established routines which

manage the rules and procedures necessary in the delivery care process.[19] Protocols must be flexible and adaptable. If they are not, they can strangle the benefit delivery process. Personal relationships help cut through burdensome regulation, and lubricate the flow of information.

Summary

This chapter has presented a model that can be used to describe the responsive activities of organizations. This model presented three categories of decisions an organization must make: strategic, administrative, and operational. These decisions are made during three distinct time periods: long run, short run, and the immediate run. Two organizations were contrasted. The offering-based firm pre-defines the offering to the individual customer, while responsive firms attempt to pre-define the needed capabilities that the individual customer will request.

This discussion led to the development of a model describing a responsive organization. This can be found in Figure 4–7. The customer and the CCP diagnose to determine the benefits to be delivered. The CCP then develops a solution to meet the unique needs of the customer. This may require the CCP to use internal capacity and capabilities or to

[19]They can also take the form of a contract, which details how care will be delivered, when, by whom, or the form of a preference card, which lists the preferences customers have in the way they interact with the supplier.

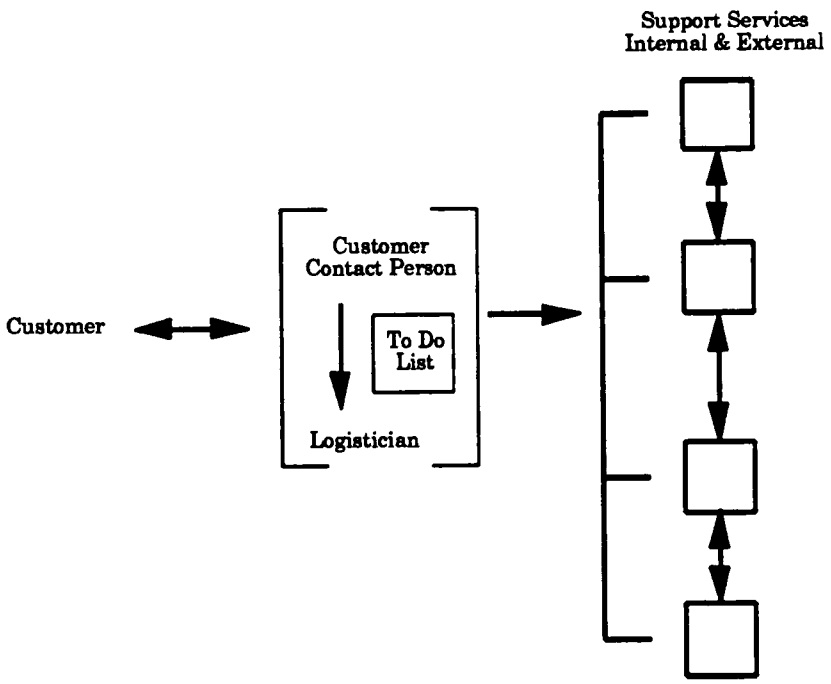


Figure 4–7
Complete Responsive Model

coordinate those activities with an outside source. Finally, the benefit is delivered to the customer.

The reader is encouraged to ask four questions as they study the three different case studies. These questions are based on the four theoretical propositions discussed in Chapter 3. First, how does an organization respond to the environment? Second, from the logistics perspective, how is the customer defined? Is the customer internal to the firm, or external? Third, how and where does coordination within the organization occur? Finally, what are some of the key relationships within the organization, and how are they managed?

The next three chapters will present the findings from three industries: contract logistics, the foreign exchange process in a wholesale bank, and health care.

CHAPTER 5

ROADWAY LOGISTICS SYSTEMS

Introduction

The use of third party, or contract, logistics firms has grown over the last several years. This growth has been fueled by increased competition, the pressure to downsize current work force levels, and the desire on management's part to concentrate solely on the firm's core businesses. Some organizations, such as Sun Workstations and Reebok, have moved fully to contract logistics firms, while others are moving slowly in this area.

Contract logistics services can provide several advantages (see Figure 5–1). As shown in the table, these focus on obtaining the appropriate knowledge base, facilities, and tools necessary for coordinating the benefit delivery process.

This section will describe the process by which contract logistics firms responsively meet the needs of their customers. This chapter will look at how Roadway Logistics Systems (ROLS) and other contract logistics firms diagnose customer needs, develop solutions to the client's individual request, and how they delivery the required benefit to the customer. In order to fully understand the rapid growth of contract logistics carriers, a brief history of the growth of ROLS is presented first.

Fewer suppliers to manage
Lower transportation costs, both freight and administrative
Higher contracted service levels (less variation due to fewer carriers)[1]
Greater control over individual shipments
Increased information and feedback provided
Reduced risk / exposure to undercharges
Corporate concentration on core business

Figure 5–1
Advantages of Using
Contract Logistics Services

History of Roadway Logistics Systems

Many new ventures begin when an entrepreneur senses a need for a new product or service to meet the needs of a particular customer or group of customers. Some companies are started at the bequest of a current customer, asking that additional services or products be offered. In many cases these requests are very specific and not transferable to a larger segment of the market, providing limited success for the fledgling company. Few companies that start at the request of a customer meet with the success earned by Roadway Logistics Systems (ROLS) over the last four years.

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[1]Variation in demand can also be managed by adding ad hoc services to capabilities offered to the customer. For instance, emergency shipments can be standardized by designating a specific carrier or carriers to use. These then are the protocols that are established, which don't say *when* you will use the service, only what to do *if* you need to use them. Standardization allows you to anticipate the variation and respond in the most cost-effective manner.

In the spring of 1989, Ford Motor Company approached Roadway Express with the desire to initiate a system similar to their European operations, where one company was responsible for all in-bound management of over 100 suppliers at Ford's Romeo engine plant.

Ford's desire matched a Roadway corporate strategic plan that was developed a few years earlier. This plan looked at the potential of the firm to design and manage dedicated and integrated distribution systems. This approach was put on hold until corporate management felt that the market would be ready for this approach. Ford's proposal unleashed the dormant plan.

In August 1989, Roadway Systems Inc. (RSI) formed ROLS, and in September ROLS was awarded the Ford contract. Since that time ROLS has added over 30 additional contracts, including such companies as General Motors, Chrysler, Philips Lighting, John Deere, Hewlett-Packard, Gates Energy Products, and Dole Dried Fruits and Nuts.[2]

Contract logistics has seen rapid acceptance by corporations. Firms are seeking new ways to "right size," or "downsize" the organization and become more focused on their own core competencies. Instead of investing scarce capital in the supply chain, firms are utilizing contract logistics carriers who have already developed the necessary support infrastructure.

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[2]Jones, Bill "Contract Logistics: Is it a Fad, Or is it a Trend?" Presentation, April 15, 1993, University of Tennessee, Knoxville, TN.

ROLS provides services ranging from warehousing to dedicated contract carriage, LTL transportation, and expedited transportation and has the capability to link rail and air transportation into a single source logistics management solution. The entire supply chain is managed by one entity, allowing for optimization of the whole channel, and not just pieces of it.

The value added that companies like ROLS provide for their customers is their ability to develop and integrate different pieces for all of the pieces of supply chain. In the past, each of the activities in the channel was managed separately. Contract logistics has changed the rules of the game by developing a coordinating process for these activities.

This process is much like an air-traffic controller, who has a process for coordinating all flights into and out of a particular area. Any small change in altitude, latitude, or speed of any single flight affects the schedule of others using the airport. A prime example of this was the impact of President Clinton's haircut on the runway of the Los Angeles International Airport.[3]

ROLS promotes the argument that having its own asset base is beneficial to the customer by reducing the total risk for both the company and the client. If a single provider, not affiliated with Roadway, decides to end the partnership, ROLS has other transportation assets that can be

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[3]Turque, Bill "Judgement Calls" *Newsweek*, Vol. 121 No. 22, May 31, 1993, pp. 18-20.

devoted to providing the service while a replacement is found. This reduces the potential that the plant may be closed down due to a vendor problem.

In reality, this advantage is simply one way ROLS can increase the reliability of the network of resources that can be used to serve the customer. This could also be done by increasing the capacity of the network.

ROLS's second reason for promoting the use of its own fleet is that it gives ROLS a greater stake in customer satisfaction. A bad reputation or experience from one part of the "family" is more likely to taint the other members of the Roadway corporation.

Roadway realizes that there is a disadvantage of relying too heavily on its own transportation assets. ROLS must always place emphasis on meeting the needs of the customer. If this is the case, then ROLS will use whatever carrier provides the greatest benefit to the customer. When the emphasis is on the use of corporate assets, it may be to the detriment of the customer. This can lead the contract logistics firm to overstate the service and performance of its in-house capabilities. Contract logistics firms must be willing to rely on outside vendors, to the extent that it is in the best interests of the customer are served.

From this perspective ROLS primary competency is an understanding of how to determine customer needs, develop workable solutions, and coordinate delivery using a wide range of products or services. The

customer's interaction is with only one originator, thereby reducing the costs (both economic and hassle) associated with managing multiple suppliers.

Contract Logistics Process

The process of evaluating the needs of the customer and providing the proper solution to the problem can be divided into diagnosis, solution development, and benefit delivery. This section will analyze this process using this triad mounted on a time line. The normative model is presented in Figure 5–2.

These three stages are not unique to ROLS, but are fairly standard to other contract logistics firms. Another contract logistics firm was also interviewed for this study, and the parallels are surprisingly similar.

Diagnosis

The first stage of customer interaction consists of diagnosing the needs of the individual customer. Each customer's needs are unique, as are the delivery solutions required. This uniqueness becomes more apparent at the tactical, or coordination, and operational level of the model. Further discussion of this will be provided later in this chapter.

One of the important tasks facing the Director of Logistics Development (DLD) is attempting to determine the motivation of the

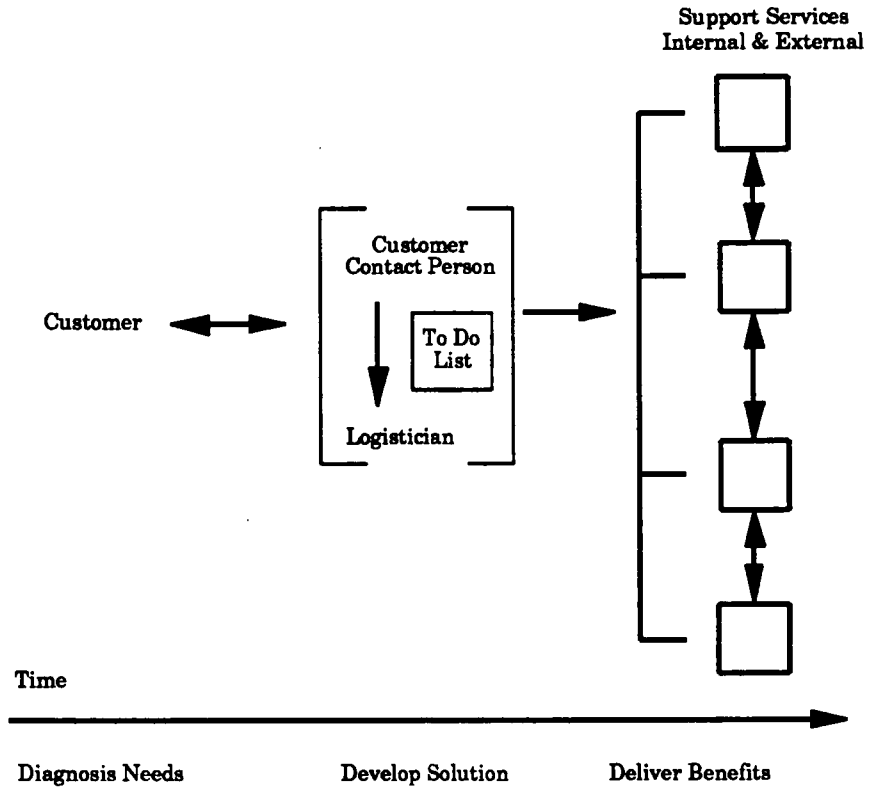


Figure 5–2
Normative Benefit Delivery Model

organization to use a contract logistics firm. If customers are just interested in reducing their rates, ROLS's probability of successfully obtaining business from the company is limited. ROLS is looking for an organization that wants to fundamentally reduce its total logistics costs.

In the past, customers would contact ROLS directly and request that ROLS bid on a contract. Little formal effort was put into marketing the capabilities or benefits of ROLS. This was done for several reasons. First, there was no immediate need to market its services. Efforts were placed on meeting the needs of current customers, and not on generating additional business. Second, RSI, the parent corporation of ROLS, has been perceived as a relatively conservative company that highly values its reputation. Had ROLS oversold any part of its ability to meet the needs of a customer, and failed, it would have reflected badly on all of RSI's subsidiaries. Finally, ROLS did not want to alienate traffic managers who were using RSI subsidiaries by marketing ROLSs' ability to streamline a corporation's logistics costs by eliminating or streamlining the firm's traffic department. This strategy of reacting to customer requests ended in early 1993 when ROLS selected five Directors of Logistics Development (DLD) to cultivate and call on potential customers in five geographic regions.

One of the services or features that contract logistics firms can offer their customers is their ability to provide responsibility from undercharges. In recent years the industry has been rocked by court decisions concerning

their customers is their ability to provide responsibility from undercharges. In recent years the industry has been rocked by court decisions concerning undercharge claims. ROLS can indemnify the customer against undercharge claims when a bankrupt carrier files undercharge claims. This is an important part of the agreement between Libbey-Owens-Ford and ROLS.[4]

Four steps are involved in diagnosing the needs of the customer. The first step is internal consideration, where the DLD, analysts, and top management discuss the best strategy in approaching a potential client. An analyst or manager may have some insight provided by working on a current project or bid, or may have actually worked with the firm in the past. These insights are communicated to the DLD and are critical in establishing ROLS as a professional, systematic firm.

The second step is the actual contact with the customer, where the DLD will make a formal presentation to the customer or a group of managers. These individuals at the meeting are usually at the Director level or higher. This presentation stresses the advantages of contract logistics and ROLS's capability to meet the total needs of the customer.[5] In

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[4]Foster, Thomas A. "The Multiple Benefit of Single Sourcing LTL" *Distribution* Vol. 91 No. 11, 1992, pp. 38-46.

[5]Had the customer directly contacted ROLS, this would be the first step in the Diagnosis Phase. In the past, this was normally the first step in the process.

that when a company starts talking about "right sizing," or "downsizing," "reducing the head-count," or "concentrating on core competencies," it may be time to consider contract logistics as a potential solution to the customer's problems.

After a request has been received, ROLS must discuss the sincerity of the request. Is it a "real" request, or just a benchmark to affirm the current way logistics and transportation is being provided? Is the firm serious about changing its provider or business, or is it after comparative information? What is motivating the customer? What does the customer value?

Sincerity on the part of the customer critical. Since ROLS's analysts and DLDs have limited capacity, they cannot respond to each and every request, regardless of the probability of success. Evaluating the customer's logistics systems and conceptualizing a solution may take several weeks to several months. In order to justify investing scarce resources in a potential customer, there must be a high probability of success.

This process of defining the probability of success is critical and is continually reviewed. In the past, because the company was smaller in size, the top managers and analysts could get together and discuss the probability of being awarded each of the contracts. This probability was multiplied against the size of the contract, as well as the potential utilization of RSI sister companies. If the probability of success for two

contracts was the same, preference was given to the amount of freight that could be moved by the corporate family. This would increase corporate profits, which benefits the entire Roadway organization.

In any relationship each side must receive value. First, ROLS must be able to enhance the value the client is receiving from the current logistics process. Second, ROLS must be able to benefit from the operation. These two values must be continually monitored. This is done at regular meetings with the managers and analysts gathering to discuss the workload for the week. The analysts are continually evaluating the project's potential to benefit the customer. The DLD is continually evaluating the customer's sincerity and willingness to contract. As analysts develop solutions, they continually develop estimations of the cost of implementing the systems and the value of the operating contract. The DLDs then have frequent meetings to discuss strategy. Preference is given to those projects with the highest potential yield. Where two projects have similar yield, preference is given to the one that makes the greatest contribution to the corporation.

One of ROLS real strengths is the protocol that has been developed for analyzing potential projects. The protocol provides the foundation for the third step, need analysis. After the customer's sincerity and willingness to contract have been established, an analyst is assigned to the potential customer. Selection of the analyst may be based on present work load, past

experience with the customer, knowledge of the industry, or a combination of all three.

The process of selecting the proper team to work on each potential account is critical. It must take into account not only the current commitments of the organization–the capacity available to serve the customer–but the strengths and weaknesses of the team members, and the capabilities of the team. The goal should be to maximize the knowledge base that the DLD and the analyst bring to the solution development process. Analysts may be selected based on their previous work experience, or past projects with the client. DLDs are normally selected based on geographic considerations, but are not geographically limited if the relationship established by the DLD positively impacts the relationship with the customer. At this point the customer provides shipment data to ROLS for further analysis.

The diagnosis stage is fast paced and dynamic. For many organizations it is reactive. That is, the customer does not have a clear plan or understanding as to how a contract logistics firm would impact the organization's strategy. The customer may simply be responding to an internal request to determine how much contract logistics would cost and have not yet reached the stage of asking how this decision would meet the strategic mission of the firm. The role of the DLD is to help the customer

understand how a more responsive logistics organization can increase the firm's competitiveness.

Contract logistics firms must also have a clear understanding of how their services impact an organization. They must develop a better understanding of the niche they are competing in. In other words, the question should not only be, "Can we get the bid?" but also "How does this fit with our strategic mission?" Once a determination has been made as to what the mission is and how a customer's bid fits into the organization's long-term goals can the firm move from being reactive in the marketplace to being responsive.

Solution Development

Solution development and need diagnosis are not discrete time units that occur in a linear manner. This is true because in the beginning the customer may not know specifically what they want from a contract logistics firm. The customer is looking for expertise, ideas, and potential solutions. Each step in the solution development stage helps identify new concepts and opportunities. Therefore, diagnosis and solution development are interactive processes, with each iteration creating a new vision and opening up new opportunities that become the basis for the next iteration and the agreed solution.

The solution that is developed by the contract firm may not be the global optimal solution, but it is one that will work. It must work, be operationally possible, and it must be operational within a given period of time. It is the "practical" optimal solution, given the constraints established by the customer and the contract logistics firm.

When the internal partners agree to the solution, the analyst will begin to solicit agreements on each piece of the package. The internal partners are the DLD, the analysts, and operations. The solution developed must be believable, and it must be practicable.

Whereas solution development follows a well-developed protocol, implementation is very customized. This is true for several reasons. Each corporation is different, as are the separate plants owned by the corporation. Each has its own culture, its own set of informal rules, and regulations that new employees must be taught or must learn. As such, operational procedures must be fluid enough to allow the operations coordinator the ability to adapt to the culture of the plant, while still meeting the requirements placed on them by the client and the contract logistics firm.

Communication between the coordinators is important. Continuous improvement can be accelerated or at least supported by learning from the experiences of the other coordinators. Due to their criticality at each site, it

is difficult to bring all of them together, let alone down to the corporate headquarters for an annual or bi-annual meeting.

For this reason communication between coordinators is facilitated by the management team. In many instances they are visited by a manager six to twelve times a year and are in constant touch by telephone. When a particular plant closes for any reason, that coordinator is sent to another site to work with another coordinator to learn more about the business.

It is critical to determine what is valued by the customer and what will continue to be valued in the future. This is difficult information to gain, especially in the long run. However the short and immediate run provides several clues as to where the market is headed. By keeping track and tabulating what services are being requested by the customer, the organization can get a feel for what is expected and what the customer may want in the future. Should the contract organization offer additional services? How can it validate its growing database? By continuing to ask questions of their customers, the coordinator monitors the needs of the customer, and attempts to maintain the fit between what the customer needs and what ROLS provides.

After the operation has been in place for the duration of the contract, Operations personnel must work to continually improve the process. From the client's perspective, ROLS has done the obvious to reduce costs; the question now is what it will do in the future to continue to improve the

process. This motivation to better serve the customer is the basis for rewarding the on-site coordinator.

To facilitate this, reward systems have been put into place that ensure the success of the coordinator, the company, and the client. Bonuses for the coordinator are based on service levels, and internal management reports, as well as total revenues and margins of the customer. An emphasis on total revenues or service levels alone would sacrifice margins, and reduce corporate profitability, as well as the probability of getting the business in the future. These two factors must be counterbalanced with accountability to margins and internal management parameters.

The coordinator not only looks at the daily activities he or she is involved with, but also reviews, studies, and suggests improvements to the system. "How can I do that better?" "What changes can be made that will benefit both ROLS and the client?" "What are other areas of growth for the organization?" This focus on continuous improvement helps to strengthen the relationship between ROLS and the client.

Long-Run, Short-Run and Immediate-Run Issues

ROLS can be analyzed visa vie the model on three different levels: strategic or definitional, coordination, and operational. Each level of analysis provides insight as to the issues facing the corporation and how

they can be responsive to the needs of their customer. A summary of these can be found in Table 5–1.

Long Run

From this perspective, the customer can be defined as the market that ROLS has identified as potential users of their service. Initially, this was defined as the automotive industry. However, ROLSs' expertise and that of other large contract logistics firms transcend many industrial boundaries.

For this reason it is imperative for the organization to determine what markets to further explore as potential growth markets. This review is currently underway since ROLS has hired individuals to work primarily on their strategic mission.

The focus of this mission is to identify those industries that can benefit from the skills and knowledge base of the organization. Initially this focus will be on firms that rely on transportation in some manner; however, there may be opportunities for growth as ROLS begins to see its competency as being the ability to design responsive management systems.

At this level there is a need to match the capabilities of the organization with the needs of the customer. For instance, capabilities cannot be too narrowly or broadly defined as to fit all markets. The railroads' narrow strategic definition in the early part of this century left

Table 5–1
Benefit Delivery Process By Time

	Diagnosis	Development	Delivery
Long Run	Who are our future customers? What needs do they have? What industries would benefit from our expertise?	Identify potential suppliers Identify new benefit delivery processes	What information systems are needed to serve the customer? What infrastructure is needed to support the organization?
Short Run	Which customers should we call on? How do we determine potential yield? Quality Checklist Initial presentation by DLD	Obtain supplier bids Review with operations and top management Review potential suppliers	Accept bids Present solution Implement solution
Immediate Run	Coordinator - customer interface	TQM CQI	Data entry Managing the solution

them out of the growing airline and motor carrier industry. Railroad executives defined their strategy as "the rail system," rather than defining their strategy as "transportation." Too narrow a strategic focus will exclude growing opportunities. Too broad a strategic focus will dilute the firm's resources, and not provide the critical mass on which to penetrate key industries or customer groups. Although ROLS's core competency is developing and operating responsive management systems its personnel need to understand the industries for which they develop solutions.

The CCP in this instance then is the strategic management team, consisting of long-range planners and top management. It is not a single individual, but a team of executives that will guide the organization. This team must determine what the customers want, and what they will want in the future.[6] This requires a look at the customer's needs and the capacity and capabilities required for the future.

In this instance capacity refers to the assets necessary to delivery benefits to the customer. This may include procurement of physical assets, developing relationships with suppliers, and developing the skill set or capabilities necessary for the employees to meet the needs of the customer.

In addition to capacity and capabilities, the strategic management team must also review and establish an infrastructure that enables the

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[6]Carouthers, Jr., G. Harland and Mel Adams, "Competitive Advantage Through Costumer Value: The Role of Value-Based Strategies" Competing Globally Through Customer Value, Edited by Michael J. Stahl and Gregory M. Bounds (Quorum Books: New York), 1991, pp. 32-66.

organization to perform its daily activities. The critical parts of this infrastructure are the information systems and networks that link the vendors, customers, and contract carrier.

Information systems are critical in developing and delivering the benefits requested by the client. This network may take the form of relationships with internal and external providers or of expert systems, such as Rite Router, a software application which automatically chooses the best routing of a shipment based on time constraints and cost. Managing the network of providers allows the contract carrier to better manage its capacity and to provide additional capabilities that may be beyond its core set of competencies. Managing the information infrastructure requires a strong commitment by the firm to invest in hardware and software necessary for linking the whole channel, from point of origin to final destination. Failure to do so will eliminate many contract logistics organizations that profess abilities, but provide little more than traditional single warehousing and transportation services.

Interestingly, this is one area many organizations fail to examine or manage closely, even though there are high pay-offs for the organization. In the past, each division or subsidiary in the corporation was developing systems solutions to its unique needs, with little regard of their impact on the total corporation. This "functional silo" approach did not allow the easy transfer of information between the sister organizations. When RSI did not

have a contract logistics arm, the lack of this interaction was not important since little information had to be networked between the different operational levels or with administration. However, as soon as an organization begins to manage by individual customer needs, regardless of the internal or external provider, then the connectivity of the technologies becomes more important.

In developing these customized solutions, the team may decide that the requirements can be developed and housed internally, or that external partners can be used. This decision primarily is based on the strategic importance of the capacity and the ability to provide the monitoring and control necessary to maintain the organization's standards.

Finally, the strategic teams must generally determine how the benefits will be delivered to the customer. In the case of ROLS and other contract carriers, coordinators are placed on the customer's site. This is one way to develop the dialogue and interest necessary to continually improve the relationship with the customer. Other methods include the use of on-line terminals and toll-free numbers. These methods must be compared and contrasted to determine which method will provide the best fit for the market.

Short Run

In this instance, administrative or coordinating decisions determine the protocols that will be used to respond to the customer, as well as the information and material flows that occur within the firm. This can be loosely viewed as a "master protocol" that tracks how the organization and the customer will interact with one another, and what steps will be taken to develop and deliver the solution to the client.

According to the protocol, the first step of the process calls for the selection of a DLD and analyst to work for a particular customer. For the DLD, the selection may be based on past experience with the customer, or on the geographical location of the representative. The analyst may be chosen on the basis of available capacity, past experiences prior to joining ROLS, experiences working on similar projects, or working for that particular customer.

The next step in the protocol is how the DLD, senior analyst, and the customer will diagnose the needs of the customer. The same basic information must be derived from each customer and be considered in the solution development. To facilitate the data collection process, checklists are used to diagnose the needs of each customer. These checklists serve as protocols to determine what the customer's needs are. Since the diagnosis process is fairly standard, the checklists are formalized and provide a starting point to evaluate the customer's needs.

During this stage it must be determined how the analyst will develop a solution to meet the needs of the customer. That is, the analyst must work with both internal and external providers to determine which components will provide the best service within the cost goals of the customer. This requires that the analyst have a working knowledge of all of the different providers in the system.

Protocols have been established to facilitate this process. Whenever possible, from a cost and service perspective, internal carriers are utilized to meet the needs of the customer. An excellent example of this is ROLS's Rite Router software, which chooses the best shipped method based on cost and service.[7] A protocol had to be initiated to determine these two factors as being critical to the customer, and then write the software accordingly.

In addition, operations is brought into the process shortly after the initial solution has been developed. These insights provide the analyst with a "reality check" to make certain that his or her solution does actually meet the needs of the customer. Operations provides the necessary costing data and the feasibility of the project.

Finally, before proposals are submitted to the customer, they must be reviewed by the DLD, the analyst, top management, and operations. This protocol ensures that the business solution is correct, manageable and profitable for the organization. Allowing all parties affected by the decision

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[7]Foster, ibid., p.40.

access to provide input one more time eliminates the potential for mis-understandings and costly errors.

This major protocol is a process flow chart, with various sub-routines that must occur along the critical path. Each customer must follow the general flow of the chart, with some taking more time at each stop, depending on the complexity of the solution.

These activities require the organization to take a team approach in interacting with the customer. In order to best adapt to the needs of the individual customer, the organization must view its internal processes not in the form of functional areas, but must take on a process orientation from the perspective of the organization. This has been coined "focused systems," as it "attempts to recapture the vitality of the small entrepreneurial organization, with teamwork cross-training of workers, multiplied skilled mangers and workers, flexible participation, common objectives, and intense focus on the customer."[8]

The basic thrust of this concept is that the organization must organize itself around the needs of the customer. Organization is customer focused and relies on a strong understanding of the benefit delivery process. Membership on the team is based either on the potential team member's

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[8]Bounds, Greg, Lyle Yorks, Mel Adams and Gipsie Ranney Beyond Total Quality Management: Toward the Emerging Paradigm (McGraw-Hill: New York), In Press 1994, p. 57.

direct contact with the customer or their indirect support of those who do support the customer.

In this instance, the team takes on different forms, depending on the duration of the relationship with the customer. Initially, the team does not include Operations personnel, but as the benefit solution is being developed, it is important to add additional expertise in this area. When the solution is being implemented, the role of the DLD or sales representative decreases as the role of the on-site coordinator increases. The role of the analyst may only be requested when new needs arise or at the end of the contract period when the contract must be re-negotiated.

In closing, a distinction should be made as to the activities in which ROLS and other contract providers become involved. The activities that a contract carrier provides are not unique; they are services that can be easily found in the marketplace or have been done by the customer for the last several years. These activities include such things as air freight, package express, less-than-truckload (LTL>, truckload (TL), and warehousing, just to name a few. The value-added and unique perspective contract logistics firms provide is their ability to coordinate (at the administrative and operational level) in a consistent fashion all of the different parts in the delivery process.

This means that the services of individual vendors may be very traditional, with little need to customize their process to meet the needs of

the customer. Rather, the customization takes place prior to the shipment or service is requested; that is, a shipment is routed according to the menu of services the customer has already requested.

For instance, a shipment could be sent by LTL, air freight, or by using a small package service. For the LTL carrier to provide the exact same benefit as the air freight provider would be difficult or impossible; in the same manner, it would not be cost effective for an air freight carrier to try to compete as a LTL carrier. Instead of the customers deciding in the immediate run which method to use to send a shipment, the customer can determine the protocol and empower the CCP to route the shipment according to the most appropriate method. This provides stability for the vendors since they are providing the service that best fits their capabilities.

Variation in the services requested by the customer are managed by the CCP. This allows for smoother throughput for the vendors because they are no longer trying to manage special requests of the customer. The process is transparent to the customer, since their concern is that the shipment arrives at the desired time at the desired cost.

Immediate Run

After the solution has been developed and been accepted by the customer, operational decisions must be initiated and managed. It is the daily face-to-face "moments of truth" that take place in the immediate run.

Operations can establish some basic protocols on how the coordinator and the client can interact with one another. However, there must be some flexibility in the relationship to allow for special needs.

When the activities and events, or the format, of these activities or events that occur between the two companies is fairly standard and defined, the protocols can be defined and in many cases automated. This is the case of electronic data interchange (EDI), bar-coding or just-in-time (JIT) manufacturing. For instance, in the case of a standard shipment, it can be pre-defined how the two organizations will communicate to one another. That one shipment is from California and another from Maine is not material; more important is that the interface and the response can be easily defined, anticipated and managed. In these cases the Rite Router system works extremely well.

When the events are not easily defined, or there are extenuating circumstances, then the contract carrier, through the on-site coordinator, must respond to these unique needs. These instances may require human intervention to approve express shipments or may require special information on a shipment or product.

The successful management of these immediate-run activities fully impact the firm's ability to continue to serve the organization in the future. Failure to manage the responses of the coordinator can result in the loss of continuing contracts.

Summary

In the past, major contract logistics firms were reactive to the environment. Whenever a potential customer called, the firm could react with a bid or decide to wait. This emphasis on daily activities precluded long-range strategic planning to determine what services or markets should be considered for future expansion.

However, as the industry begins to accelerate up the growth curve, market share can be lost if the organization does not provide the services made available by competing firms. It may even be possible to gain market share on early entrants if the mix of services better fits the needs of the market.

This issue revolves around answering two different questions. First, "What services do our customers expect and will expect in the future?" This is a capacity and capability issue. The second question is, "What industries can utilize the skill set we now possess?" This is a question of fit at the strategic level. The first question is a matter of reacting and then responding to the customer, while the second is a matter of researching the needs of a new industry.

The model first described in Chapter 4 was applied to ROLS, and it was shown how the issues facing the organization could be illustrated based on the three different levels. Potential gains from exploring the issues

using this model will allow the firm and subsequent firms a framework for viewing their activities.

CHAPTER 6

UNION BANK OF SWITZERLAND

Introduction[1]

The new way to think of banking is as information in motion.[2]

The Union Bank of Switzerland (UBS) was formed in 1912 as a result of a merger between the Toggenburger Bank and the Bank of Winterthur, which had been formed in 1863 and 1862, respectively.[3] After several mergers throughout the next few decades, UBS entered the U.S. market in 1974. A relative newcomer to 299 Park Avenue, UBS has experienced rapid growth and notoriety as a solid performer. *The Wall Street Journal* predicted that UBS will be one of the top twelve banks in the world by the year 2000.[4]

From the outside, UBS looks like a well-run, sophisticated wholesale bank, no different than the competition. The financial vehicles offered to customers are similar to those offered by other major American banks. UBS

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[1]The case study was conducted February 16-19, 1993. While this analysis attempts to describes the logistics activities at that time, they may not accurately reflect the present condition of logistics at UBS.

[2]Chorafas, Dimitris N. and Heinrich Steinmann *High Technology at UBS - for Excellence in Client Service*, (Union Bank of Switzerland: Zurich), 1988, p. 16.

[3]Moody's Investor Services, *Moody's International Manual* (The Service: New York), 1992, Vol. 2, p. 4449.

[4]*The Wall Street Journal*, March 25, 1991, pA4(W) pA4(E).

offers asset and project financing, investment banking, access to money markets, foreign exchange and the precious metals market, and personalized banking services for high-asset individuals. These offerings are housed in several different divisions such as Treasury, Private Banking, Investment Banking, and Equities. And, to support these activities, there is the Division of Logistics.

This division is unique in American banking and warrants further description. Approximately forty percent of all UBS employees in North America work in the Division of Logistics. What is more impressive from a logistics perspective is the internal infrastructure of the organization. This study will focus on the activities of the foreign exchange group. The purpose of this case study is to review what logistics means to UBS, how it affects the operations of the organization, and what lessons can be learned from this approach. This will be accomplished by reviewing how UBS defines Logistics, and how the foreign exchange process works. Two questions will as the focus of the case study:

- What is the relationship between the logistics division responsible for delivering the support infrastructure and the front-line division responsible for delivering benefits to the customer?
- How does the logistics division function?

Finally, the internal coordination of the foreign exchange process with logistics will be compared to the product and responsive model described in Chapter 4.

Logistics at the Union Bank of Switzerland

According to Dr. Heinrich Baumann, First Vice President[5], UBS interacts with its customer directly through six separate divisions: Corporate and Institutional Banking, Investment Banking, Treasury, Fixed Income and Swaps, Equities, Private Banking, and Institutional Asset Management.[6] These six divisions provide sales and income for the corporation. Logistics then is directly responsible for enabling the front line to meet the needs of the customer. For UBS,

> Logistics supplies the Bank with all of the resources needed for the efficient, rapid and high-quality processing of its business. Logistics performs the following tasks: develops, in collaboration with the users, the necessary solutions and principles for the timely and economical processing of all banking transactions and to aid in their implementation; supports management functions at all hierarchial levels of the Bank; provides the internal resources needed for the Bank's business activities; and ensures and maintains EDP operations and telecommunication networks.[7]

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[5]Dr. Baumann has since been promoted to Senior Vice President.

[6]Baumann, Dr. Heinrich Presentation at the Council of Logistics Annual Meeting, San Antonio, Texas, October 11, 1992.

[7]*Orientation Program for New Staff Members*, UBS Regional Training Center, New York, April 1992, p. 32.

These logistics departments include Human Resources, Accounting and Controlling, Organization, Training Center, Internal Services, Operations, EDP, Telecommunications, and Management Infrastructure and Support.[8] Figure 6–1 depicts the support role Logistics plays for the six front line divisions of the Bank.

Figure 6–2 illustrates the role of logistics in a more generic perspective. The bank customer directly interfaces with one or many banking functions which could impact any of the six front-line divisions mentioned earlier. The front office diagnoses the customer requests or needs of the customer and determines if UBS can meet the needs of the customer. Often the customers will not have a clear understanding of their need so the front line must help customers develop a clear understanding of their needs and options. Logistics supports the front office by providing the technical and physical infrastructure needed to carry out the business of the organization.

When the needs of the internal customer (a UBS division or department) cannot be met internally, logistics is used to bring the needed expertise or support in-house. This may take the form of specialized training or of services that will be used on an ad hoc basis.

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[8]Ibid., p. 33.

Figure 6–1
Logistics as a Service Organization
Source: Baumann, Dr. Heinrich Presentation at the Council of Logistics Annual Meeting, San Antonio, Texas, October 11, 1992.

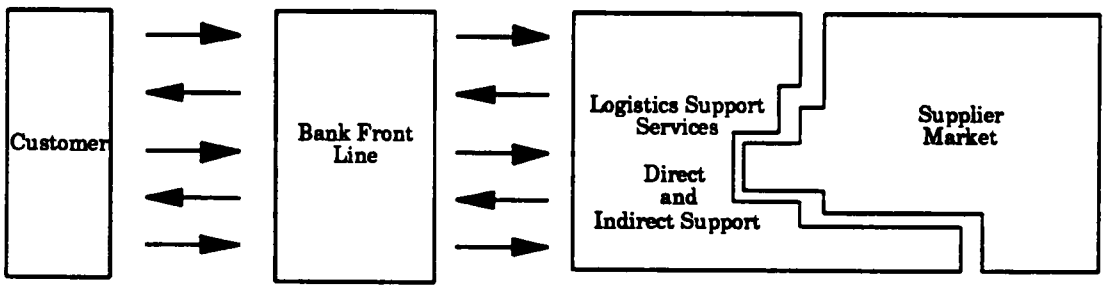


Figure 6–2
Role of Logistics at UBS
Source: Baumann, Dr. Heinrich Presentation at the Council of Logistics Annual Meeting, San Antonio, Texas, October 11, 1992.

Internal logistics functions must be able to provide their services at a cost- competitive rate. Divisions are allowed to use outside contractors if the cost of an internal support group is too high or if the expertise is not available in-house.[9] The goal is to make the interface between external suppliers and internal customers as transparent and hassle free as possible. The support process will be illustrated by discussing the interaction between the front-office personnel responsible for the foreign exchange process and the various roles played by some of the supporting departments that comprise Logistics in delivering benefits to the customer.

Foreign Exchange Process

In general, there are two basic ways in which the bank can earn or increase its profits. First, it can concentrate on the price the front line charges for its products or services and on maintaining the desired profit margin. This view looks beyond the boundaries of the firm to increase profits. Traditionally, the field of marketing has studied what price a person is willing to pay for a particular good or service. This price represents the value of the benefits to the customer. In this instance, finance has studied how to best maximize the spread between currency exchange rates to maximize profit.

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[9]The ability of the various divisions to outsource is indeed practiced by the organization. Support services are market driven and must provide the benefits requested at a competitive rate. In fact, some of the internal processes are benchmarked against external providers to ensure the cost efficiency of the service.

A second way to increase profits is by reducing the costs associated with delivering the benefit to the customer. This approach looks at internal operations and attempts to identify steps in the process that are redundant or unnecessary. When a product is produced this field of study is normally referred to as operations management. However, in the area of services, little has been done to study the processes used to deliver benefits to the customer.

Studying outcomes, such as customer satisfaction or value, should not be confused with understanding the processes that deliver that value to the customer. Many researchers have explored the attributes of customer satisfaction, or service quality,[10] but few have developed the linkage between customer value and the logistics delivery process.

Ideally, effectiveness in identifying opportunities and transaction effectiveness should be considered simultaneously. In the case of foreign exchange, traders must be aware of the actual cost of funds and know how to maximize the margin in the short run, as well as what they believe the market will do over a very short period of time. This task requires an immense amount of information that must be provided to the various trading desks.

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[10]Zeithaml, Valarie A., A. Parasuraman and Leonard L. Berry *Delivering Quality Service: Balancing Customer Perceptions and Expectations* (The Free Press: New York), 1990. Also, Holcomb, Mary Collins *Customer Service Measurement: A Methodology for Increasing Customer Value Through Utilization of the Taguchi Strategy*, unpublished Doctoral Dissertation, University of Tennessee, Knoxville, 1992.

The foreign exchange product offering concept is fairly simple. International trade generates the need for foreign currency exchanges. A firm in the U.S. may sell a product in Europe for 100 Swiss francs and then convert the Swiss francs to U.S. dollars to pay for materials and manpower and reclaim a profit.

Banks will convert the Swiss francs based on an "average rate" that fluctuates day by day. For many small importers and exporters, this may be acceptable. However, when firms like international banks move large amounts of currency between countries, there is an opportunity to earn additional profits by speculating on whether the currency will rise or fall during a very short period of time. In other words, the Foreign Exchange Department attempts to take advantage of the variation found in fluctuating currency markets.[11]

Traders gather on-line data from across the globe and speculate whether a particular currency is going to rise or fall. If the value of the currency is as high as they think it will get, they sell one currency for another; if it is valued too low, they will buy and resell when the value goes up.

These trades are done instantaneously and require a huge amount of logistical support. Telephone lines are needed to link the traders with their

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[11]Some banks, et al. will be content to play the market; however, UBS wants to be considered as a "market maker"; this implies moving from reacting to what everyone else does to taking a position, and having others respond to it. This method is much more methodical, and requires more information to sustain. A wrong position could cost thousands of dollars.

counterparts across the world. External news services must be accessed to provide the trader with as much information as possible. Operations must be geared to move the funds within a three-day time window. This process will be described in the next section.

Logistics Support in the Foreign Exchange Process

Operations

The Operations area provides the day-to-day support for the front line. It is directly responsible for managing the foreign exchange process from the point the trade is made until it is settled a few days later. Since the operational support for the product is fairly static, an offering-based approach for direct logistics support can be utilized. This process is diagramed in Figure 6–3.

Operations consists of group of clerks and managers responsible for all domestic, corporate, and international trades. When a trade is entered into the Front End Foreign Exchange Trading System (KLM[12]) by the trader, it is printed in Operations where it is batched by type (domestic, corporate, or international) by the Liaison desk. Assuming the transaction is a corporate in nature, the corporate settlement desk confirms the trade with the customer to reduce the potential for fraud or error. The corporate settlement desk then prepares the trade for input into the information

[12]The actual name of this program has been disguised.

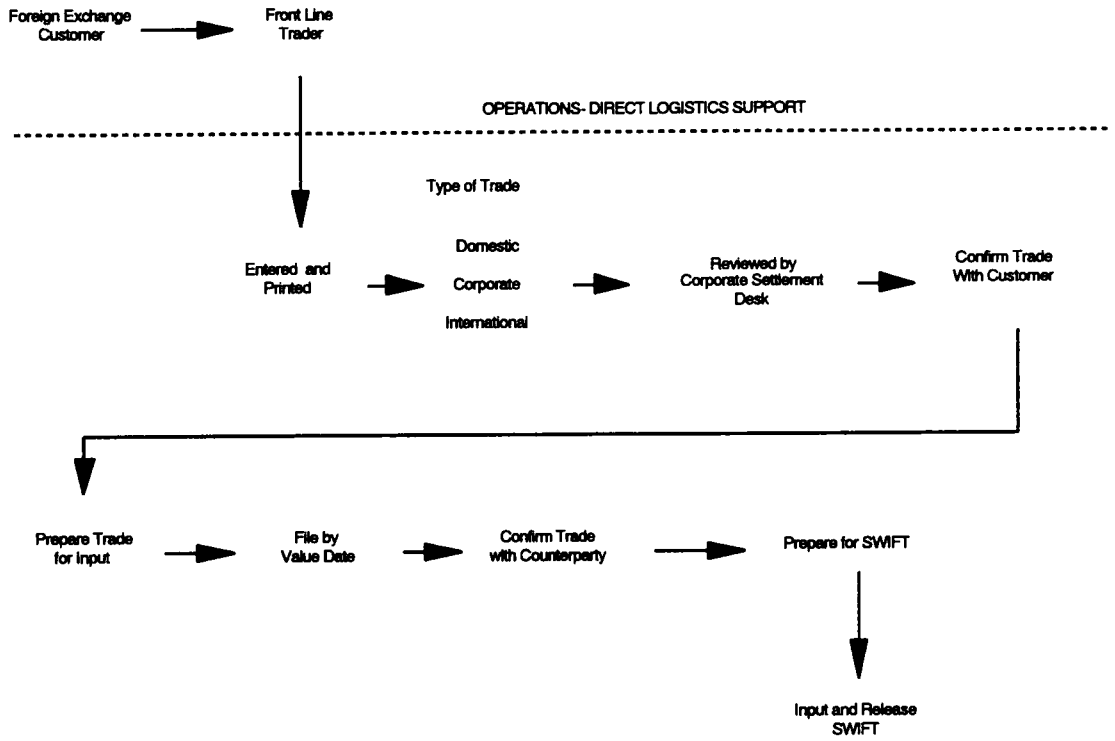


Figure 6–3
Foreign Exchange Process for Corporate Trades

system. The trade is then filed by the value date, which is the date when the transaction will be settled. The next step in the process is to retrieve outstanding trades, and notify the customer of maturing deals. This is especially important when customers may varying preferences concerning the settlement of a particular trade.

When the transactions between two parties is fairly routine, wholesale banks can use standing instructions, which direct how the order will be processed, which bank to bill, and which to pay. These standing instructions may vary by customer, as well as currency.

In the case of corporate trades, after the customer is contacted the settlement method is determined with the counterparty. The counterparty may wish to roll, net or settle straight on the transaction(s) between the institution. In some foreign exchange trades, this can be facilitated by FXNET, a company that calculates the difference of all the trades between each participating bank and sends or collects the difference from the participants. The net amount to be transferred is then confirmed with the counterparty via telephone, and the settlement desk prepared the transaction for SWIFT.

SWIFT (Society for Worldwide InterBankFinancial Transactions), effects payments between the trading institution and the counterparty. Input is done at the Breakdown desk, and it is released by a foreign exchange supervisor. Hard copies of the trade are sent to the settlement

desk after the trade to ensure accuracy and release of the trade.order will be printed and attached to the deal ticket.

One of the reasons for using technologies like SWIFT and FXNET is to reduce the amount of paperwork needed to manage over four thousand trades per week. This reduces the cost of operations and allows the Bank to earn a profit on even small differences between currency.

On some occasions there may be problems with the paperwork or information on a particular trade, requiring the settlement desk to get additional information. Instead of having the settlement clerks call the trading desks directly, foreign exchange communicates its needs to a trading room clerk who provides the requested data. The interface is not dependent on the type of error or the trader involved, but rather the communications protocol between the two offices.

The operational support provided to the front line is direct and enables the foreign exchange process. However, it is only one segment of the support needed in the delivery process. The other dimensions are discussed below.

Accounting

Accounting provides an interesting role. While there is the external requirement to provide the data required to stay in compliance with various state and federal laws, Accounting is a primary motivator to better meet the

needs of the internal customer, the front line. This is evident in statements made concerning the purpose of the organization. As one memo stated, Accounting wants to be able to quickly respond to the needs of the front-line departments. That is, "if they are thinking about a new product–we want to be ready before they are!" This requires the creation of the necessary infrastructure to support rapid implementation of front-line changes. Being responsive to the internal front-line customer enables the front line to benefit the Bank's customer, which ultimately adds value to the company.

Another example of this can be seen in how the department views innovation. One memo stated that in the Accounting department, "We are committed in gathering and distributing meaningful management information in order to help management discover and act upon opportunities for profit".

The purpose of the Accounting department is to develop tools and skills necessary to support the rest of the company. It is not in dictating how or what the organization should do; rather, Accounting exists to support its internal customers and meet the regulatory requirements placed on it by its external customers.

To do so may often require the use of technology. Technology is not used for the sake of using it; there must be a pay-off of some type. Another memo stated that this pay-off is to "use high technology to be more efficient and get our jobs done more easily".

Two examples of how Accounting meets the internal needs of UBS include daily profit and loss statements and limits used to determine the amount of equity that will be placed at risk in different investment options.

One of the projects Foreign Exchange Accounting has worked on has been the development of a daily P/L (Profit and Loss) Statement by trading desk. Two other divisions, Equities and Treasury and Fixed Income, had already used the daily P/Ls developed by Accounting. This tool allows the managers to monitor individual traders and assist them in managing overall risk. Prior to this system, it would have taken longer to determine how profitable a particular trading desk was or what currencies were being traded the most.

It is interesting to note how this tool came into play and how it had evolved over the course of a year. A change in personnel brought a manager to the division who had had access to the P/Ls in another division, and he requested that his group receive the same tool. Accounting agreed and hired a former foreign exchange trader to help develop the statement. Instead of developing a standard P/L, the accountant met with the traders and managers to determine the best means for presenting the data and explaining to the department exactly how the statement could be beneficial to them. The tool was initially prepared manually on a PC by entering data from two separate systems. While initially more time consuming, it allows the front-line customers to review the information and request changes

prior to implementation on the mainframe.

While the daily P/L is not required by Generally Accepted Accounting Principles (GAAP) or by corporate headquarters, it meets the needs of the department and allows them to better respond to changes in the market. Managers can better monitor and mentor their employees, because they have the information available to them. Monitoring allows both employees and management to track delivery effectiveness and identify fail points. Mentoring is specialized assistance and training given to individual employees to help them be more effective in responding to customers.[13] Management can be based on facts, and not on assumptions.

The second area which Accounting has become involved concerns capital limits and risk associated with investments. Accounting has begun to develop tools analyzing the trade-off between risk (How much money are we prepared to lose in a specific financial tool?) and return (How much interest can be earned?). These two areas may lead to limits being placed on how much equity is utilized in any particular division.

A hypothetical example can be found in Table 6–1. Assume that the Bank has a billion dollars of equity it is willing to risk in various securities and instruments. The billion dollars is then divided or rationed between four different divisions. In this case Division A received 20 percent of the

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[13]Davis Jr., Frank W. and Karl B. Manrodt "Principles of Service Response Logistics" *Proceeding of the 1991 Annual CLM Conference*, (CLM: Chicago) September 29 - October 2, New Orleans, LA, Vol. 1, pp. 337-356.

	DIVISION			
	A	B	C	D
Percent of Equity at Risk	0.2	0.1	0.4	0.3
Equity Available	$200,000,000	$100,000,000	$400,000,000	$300,000,000
Worse Case Factor (Percent)	0.05	0.1	0.05	0.04
Limit on Division	$4,000,000,000	$1,000,000,000	$8,000,000,000	$7,500,000,000
Rate of Return (Percent)	0.15	0.1	0.2	0.07
Profit per Year	$600,000,000	$100,000,000	$1,600,000,000	$525,000,000
Percent Return on Equity	300	100	400	175

Table 6–1
Risk and Rate of Return

risk equity (two hundred million dollars). At worst, managers in the division have calculated that there is a 5 percent chance the Bank could lose all of its money in that investment. This then limits the total exposure that the Bank will have in that single division or instrument, and in the case of Division A, it would be limited to investing $4 billion (200,000,000 / .05% = 4,000,000,000).

The next step is to review the rate of return on the investment as well as the rate of return on the equity available to the division. In the case of instrument A, the return is 15 percent, but the rate of return on the exposed equity is 300% (600,000,000 / 200,000,000 = 300%). Instrument D has half the rate of return, and half the risk, and generates approximately the same rate of return on the exposed equity. This information can then be used to efficiently allocate scarce resources within the different divisions and regions.

These two examples show how Accounting supports the front line and upper management. It provides accurate, timely information on the use of assets to assist the front office to enable them to maximize yield (profit) on a continual basis. Accounting pro-actively seeks opportunities to provide the necessary information that will allow the front line to be more effective in their jobs. Accounting also tracks external reporting requirements to ensure that UBS meets all corporate and external financial procedures and regulations. In summary, Accounting enables the front line in an

"information-gathering-processing-reporting" way.

EDP

As with Accounting, the role of Electronic Data Processing (EDP) is to anticipate the needs of the customer and provide the technical and infrastructural support necessary for the front line to compete in the market. This requires the department to be pro-active and responsive in nature.

This pro-active stance is manifested in several different ways at UBS. The most obvious way to even a casual observer is the willingness of the department to re-structure its organization to better meet the needs of the internal customer.

An example of this attitude is seen in what EDP views its role will be in the future. Currently, the role of information systems support makes up the greatest percentage of importance to the group; however, over time more responsibility for this will shift to the end user, and the role of functional management will increase, as shown in Figure 6–4. Functional management is defined as "Direct responsibility across the organization for management of processes, standards, policies and projects."[14]

Given the dynamic nature of the computer market, a question facing the EDP group is, "What technologies should we be interested in? What

[14]Baumann, ibid.

Figure 6–4
Changing Role of Information
Source: Baumann, Dr. Heinrich Presentation at the Council of Logistics Annual Meeting, San Antonio, Texas, October 11, 1992.

mechanisms are in place to seek out new technologies, explore their potential, and bring them in-house? How do we use technology to meet the needs of our customers?" This is an attempt to scan the technological environment to determine which innovations should be more formally researched.

When new technologies are identified, the next step is to determine, along with the front office, how these tools can benefit the Bank. In some cases they reduce current operations costs, or they allow for more or better transactions to take place. Since overhead is assigned to the front-line offices based on the actual costs of direct and indirect logistic support, EDP must ensure a customer will benefit from the technology before it is installed.

For instance, it may be that WORM (Write Once, Read Many times) disks or imaging technology can be utilized by the bank. Yet where does this technology fit in? How can it be used? What impact would it make? Which divisions would benefit from it? These questions can be asked and answered before the technology can be introduced into the organization. This requires a technological "scout" to review these advances, and see how the technology can be supported within the firm.

For instance, imaging technology may make the foreign exchange process more efficient by eliminating paperwork from the system and reducing the number of support people necessary in Operations. The front

line would benefit from lower operating costs. Logistics would benefit with increased productivity rates for each employee. Since the technology would impact both groups, it would be necessary for both Logistics and the front-office to agree to its adoption.

Currently, the EDP group is responsible for the development and maintenance of several interrelated databases and applications, as illustrated in Figure 6–5. In many instances the program has a unique application, such as foreign exchange, which is supported by KLM. KLM is one of the inputs in the Precious Metal and Foreign Exchange System (PFX[15]). Data flows from the KLM system into PFX, which then flows into the Regional Data Platform. It is at this level that integration across the different products occurs, which results in the development of various management reports and analysis.

Each of the separate applications, such as KLM or PFX, is linked to the regional data platforms with distinct "hooks." These hooks standardize the format of the information flowing from one application to the next. In this way applications can be updated or replaced with the goal being little to no disruption on the total system, provided the hook or interface formats the information in exactly the same way as the previous system. In some instances it is up to the software vendor to develop and maintain the

[15]The name of this program has been disguised.

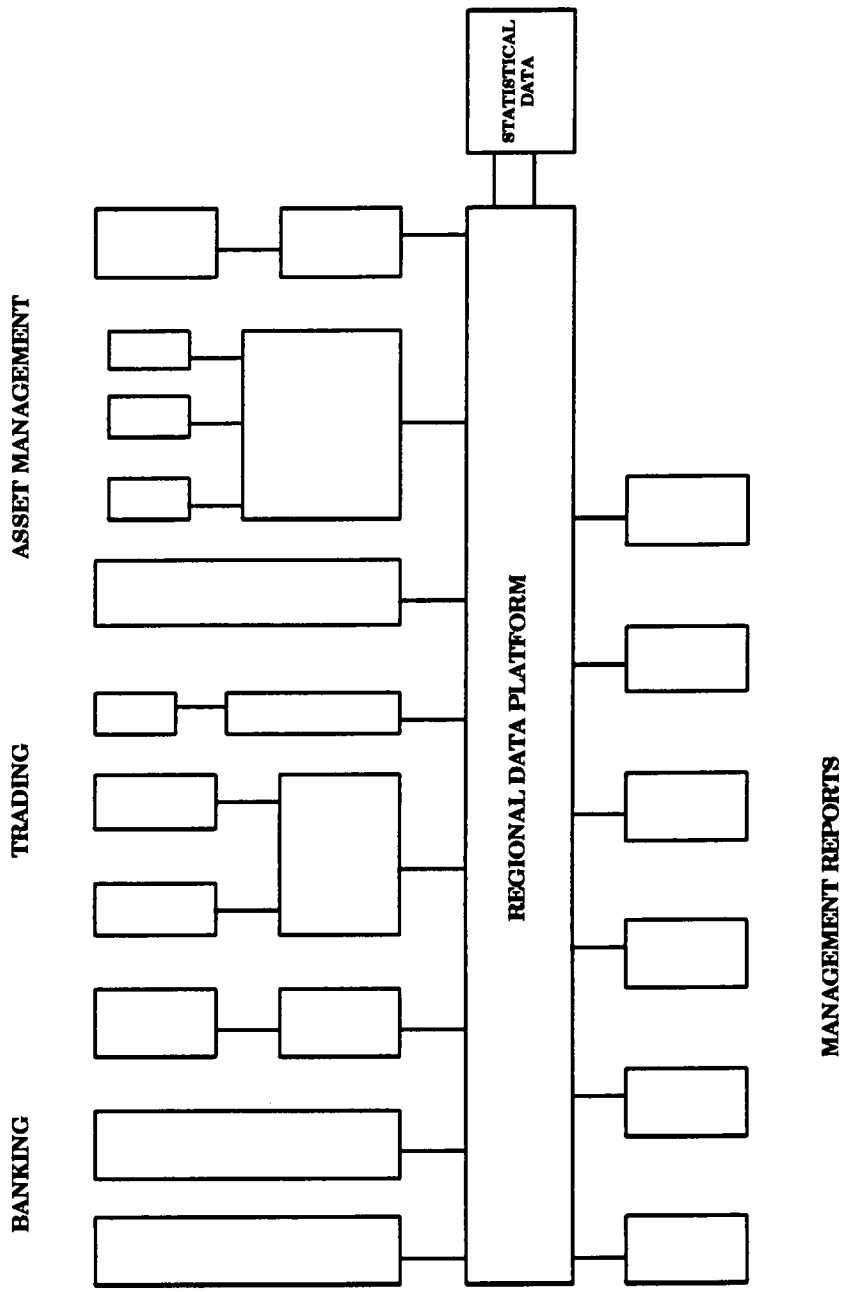


Figure 6–5
Information System Portfolio
Adapted From: Baumann, Dr. Heinrich Presentation at the Council of Logistics Annual Meeting, San Antonio, Texas, October 11, 1992.

integrity of the interface. This frees up UBS personnel to work on more pressing projects without having to become experts on each particular application.

In the same way that these hooks standardize the information format between applications, UBS has also standardized the mainframes, PCs, and PC software applications. Setting global standards on hardware and software has increased the Bank's ability to communicate quickly and easily. For instance, the standard PC is manufactured by Compaq, and the standard word processing package is Word for Windows by Microsoft.[16] The impact of these decisions will be discussed shortly.

EDP also provides Foreign Exchange the support needed for the telephone and data lines feeding into each of the trading desks. Each desk may have three or four computers tuned to various data services like Quotron or Reuters and eight to twelve speakers tuned to currency traders from across the world. Additional personal computers and printers are also located on the floor to support the currency traders.

When a trading desk requests a new data service, Logistics must provide the technical infrastructure that enables this to occur. This may take the form of new lines being brought to the floor and room for the vendor's equipment to be installed on site. In some instances a data service may offer a "no charge thirty day trial" use of a particular data feed.

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[16]Interestingly, very few of the Bank's employees use a different software than what is supplied and supported by the Logistics department.

However, this service is far from free, given the costs of installing and supporting the installation of the data equipment. These costs alone make the offer of a "no charge" trial not very free at all.

Another part of the EDP group is a support desk for PC users. During the last decade there has been an explosion in the use of the computer, with over 1,200 machines at the Park Avenue site. The support desk configures new machines, diagnoses user problems, and updates user systems.

This group responds to the needs of the individual internal customer and thus provides indirect support to the foreign exchange process. This is accomplished by answering user questions in person or on the telephone and by the use of a designated PC coordinator in each of the departments. The coordinator, much like the security liaison, serves as the main conduit for information and support. These coordinators meet regularly with EDP to explore opportunities for growth and improvement. It is at these meetings that the EDP group begins to sense what the future needs of the customer will be.

Management Infrastructure and Support

Most people, if they thought of logistics in a bank, would identify maintenance and operations of the facilities as one of the important parts. This is true, but somewhat limiting. In reality, there is more to

infrastructure than maintaining the premises.

At UBS, this section is concerned with five different areas: Services, Training, Publishing, and Premises and Security. The Services group is concerned with facility management such as the mail room, purchasing, and general maintenance. Training is responsible for providing programs for employees, either by developing them internally or facilitating the use of external providers. Publishing helps in developing marketing materials, presentations for clients, and desktop publishing. Premises overviews regional construction and internal moves of the departments. Security is responsible for providing security for both the physical premises and the information stored in the facilities.

The security of information starts with determining who would have access to the mainframe. With the explosion of personal computers, additional measures were needed. While posters and the like can be used to illuminate the importance of security, this methodology can only go so far. To continually keep security at the top of everyone's list, UBS has appointed a security administrator within some of the departments. This individual acts in much the same way as the PC coordinators discussed earlier.

Premises and Security is not only concerned with when and where departments will be moved to, but is also interested in tracking the actual costs associated with providing the necessary physical environment for the Bank to function. These costs are normally thought of as overhead, with

little understanding of where the costs are derived. One of the goals of the department is to make overhead charges as transparent as possible. This is done by tracking individual costs to their lowest possible denominator.

Departments are charged directly for the office space and furniture they use. If the furniture is new, for instance, the department would pay a higher rate than if the office furniture were used. In addition, departments are charged by the square footage of space required for them to perform their duties. If less room is needed, Premises will attempt to shift space to another department that is expanding. Control of the front-office costs, normally thought of as overhead, can be better managed by the front line. The goal is to become as transparent as possible in allocating costs and to remove the emotional issues from overhead allocations. This is done by allowing the user to impact the amount that they will be charged.

It should be noted here that the support services, such as Operations or EDP, also are charged these overhead costs and must "recover" them from the front-line offices. For the front line, lower costs associated with operationally delivering the benefit means higher profit margins. For Logistics, lower costs means that services can be provided in-house more efficiently than by bringing in outside suppliers.

These various support services impact the delivery process in different ways; some obviously are more important than others. These

differences and how they can be modelled are the subject of the following section.

Models Utilized by UBS

As discussed in Chapter 4, a service organization can take two basic approaches in organizing its tasks. The first is an offering-based approach, which treats each of its services as a commodity, and little customization to meet the needs of a specific customer. The other approach is the responsive model, where the goal of the organization is to diagnose the needs of the individual customer and deliver the benefit as requested.

UBS is unique in that it uses a hybrid approach of organizing its tasks. For those tasks that are routinized, the Bank uses the offering-based approach. Typically, these routinized tasks deal with direct logistics support. For those support services requiring a higher level of customization, the Bank uses the responsive approach. This is typically used for indirect logistics support services. Each of these approaches and uses is described below.

Offering-Based Model

Since the operational support for the foreign exchange process is fairly static, an offering-based approach for direct logistics support can be utilized. The units that comprise operations can be considered "service

elements," which make up the direct support necessary to fulfill the commitment made by the front line.

This approach works well in wholesale banking, where different people within the same customer organization may be involved in the acquisition of various services provided by the bank. There is little need at the lowest levels of the organization to aggregate information on client lists, since each division serves a different client.

For instance, assume that UBS serves a particular client, Company Y, by providing foreign currency exchange, asset management and corporate banking services. At the operational level, a foreign exchange trader is involved with foreign exchange, and would interface with Company X's person in charge of foreign exchange. Another UBS employee may be operationally involved in asset management, and interface with a whole different set of Company Y employees. If Company Y is large enough, a UBS manager may be assigned to this particular account to oversee that all of the needs of the customer are properly executed and met. Had the same individual case manager been involved at the operational level in all three areas, special considerations would have to be taken into account.[17]

Changes that do occur are more technical in nature and are not

[17]This is one reason why companies like hospitals have a greater need to share information across divisions; it is the same patient that goes between each division. The same would be true for a retail bank which provides CDs, savings accounts, checking accounts for a single client. To be effective, a single person must know where his or her client has invested their money with the bank and how well those investments are performing for the client.

refinements on the product delivered to the customer, but alter the actual delivery process. However, even these changes are fairly constant in that they do not change on a daily or yearly basis.

Second, each product offered by the Bank can be thought of as a single service element, complete within itself. The delivery units and protocols necessary to deliver the benefit may be unique and dedicated to the particular product. Each product line may serve a particular customer, which interacts with the Bank's front office. Transactions are supported directly by operations dedicated to that service. Operations may interact with suppliers or with the support staff of the external customer to deliver the original benefit as requested.

The drawback to the process is that the corporate system may be sub-optimized, since each of the service elements are optimized to meet individual product needs. This means that each individual front-line unit's support services may be optimized, but at the expense of the corporate entity.

It would be extremely expensive, time consuming and complex to unite the various departments, with little anticipated payback. Just as each product has its own life cycle and rate of change, so does the technology attached to it. If products were operationally united, this would mean that instead of changing a single data system, such as foreign exchange, Logistics would have to change foreign exchange and several other systems.

Given the costing method used to determine overhead, it may be effective to change the information system of one product, but too expensive to do so for another. Thus, by separating the products and the direct logistics support necessary to deliver the product or service, greater visibility can be seen concerning the delivery costs.

Figure 6–3 shows the support necessary in the direct operations of the product. How then are indirect logistics support effectively and efficiently provided to the front line? How are other logistical units coordinated to support the front line? This is accomplished by developing a standard protocol for communicating information between the various departments in a consistent fashion. Instead of using a product-oriented model, a responsive model of coordinating activities are used for the various support services and indirect logistics.

Responsive Model

When the needs of a customer are stable and pre-defined, it is efficient to develop systems to meet the anticipated needs of the customer. When the needs vary, or the delivery of the need cannot be pre-determined, it is more effective to develop relationships with the customer that enable the delivery of the benefit. At UBS this is accomplished by the use of designated administrators or clerks who serve as designated liaisons between the front line and the logistics support group. Figure 6–6

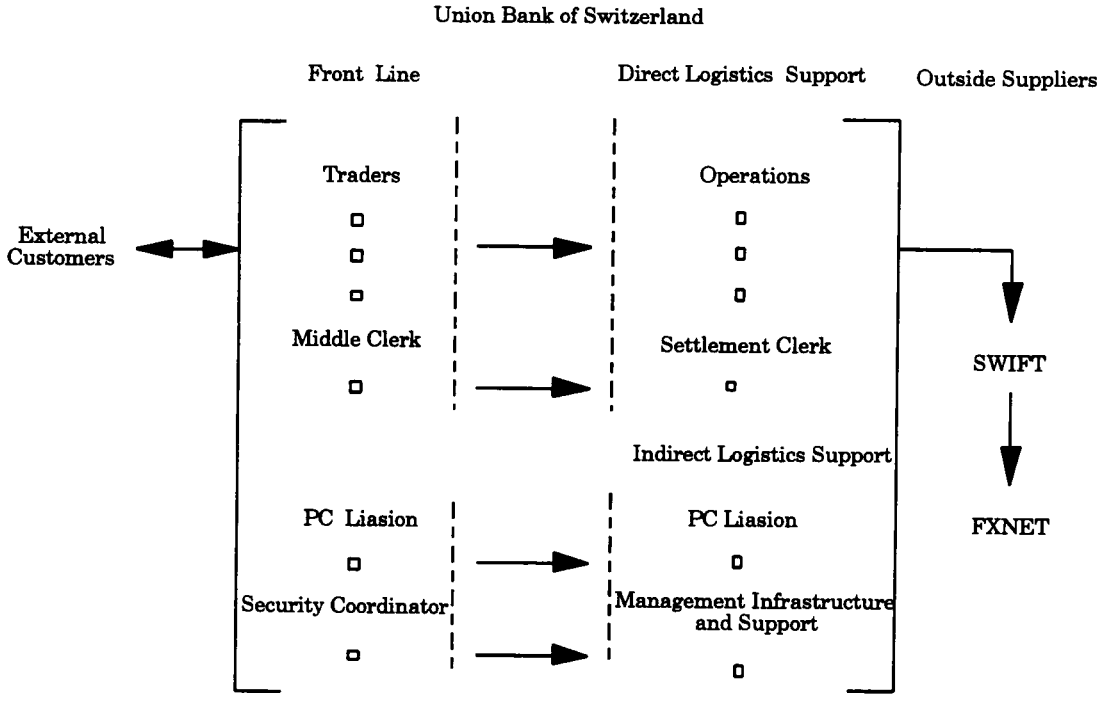


Figure 6–6
Delivery of Direct and Indirect Logistics Support

illustrates the role of the liaisons in linking the front line and back office.

This technique reduces the hassle of asking, "Who do I call when...?" As such, the indirect logistical support of the organization follows the responsive model, consisting of need diagnosis, solution development, and solution delivery. Each of these three parts will be discussed in turn.

Diagnosis

Logistics at UBS must be able to support technical and operational changes required by the front line. Diagnosis is not a one-time question and answering period, but rather a continual relationship with the customer. Anticipation of the customer's needs becomes important with indirect logistics because the level of interaction may not be as great as in direct logistics.

Diagnosis is done on a continual basis using divisional meetings at the highest levels where the front line and support services can meet to better understand the needs of the customer. Short-term problems and long-term needs and solutions are discussed. This provides a forum whereby complaints and suggestions can be relayed between logistics and the front line.

In addition to these interdepartmental meetings, there are also individual weekly staff meetings. Unlike the large staff meeting format common in other firms, UBS utilizes individual one-hour meetings between

an employee and his or her immediate supervisor. The meeting agenda covers unresolved business from the earlier meeting, status of ongoing projects, and areas of future concern. The meetings can last up to one hour; these times are considered "sacred," in that nothing is to interfere with their schedule. A supervisor of four associates would then have four hours dedicated to meeting one-on-one with his or her employees. The manager of that supervisor would meet with him or her for an hour, and the Vice President would spend an hour with the manager.

In addition, this method keeps the lines of communication open with the "four eyes" principle. This means that both the front-line office and the logistics support services view projects from each of their perspectives. The front line office views projects with the needs of the customer in mind, while logistics views the same project from an operational perspective. This allows the needs of both the customer and the support services to be considered. This methodology was illustrated with the project replacing the KLM information system.

Some may argue that this commitment of time to meetings is too expensive and unproductive. It would be if there was not a general understanding of what the purpose behind the meetings is. It is here that mentoring and monitoring of the employee can take place. These meetings allow for a free flow of information, enabling employees to better understand the changes occurring in the organization.

In summary, diagnosis is done on a continual basis with both customers and providers of the service. This is accomplished with weekly meetings as one vehicle used to determine the direct and indirect logistical needs of the front line. This provides support services with the feedback necessary to modify their benefit delivery process to meet the needs of the front line.

Solution Development

From an operational perspective, developing the solution[18] for each of the products can take place relatively insulated from the rest of the Bank's products. At the operational level, change in *how* a product is delivered affects only that product, and not the others.

When operational changes are made, attention must be paid as to how it impacts the rest of the information systems and the Bank as a whole. Regulatory requirements must still be met, and concentration need only be placed on linking the information needs at the upper levels in the firm, and not at the tactical or lower levels.

Delivering the Solution

The delivery of the benefits requested by the front line must be divided into two complementary tracks. The first delivery is the proceeds of

[18]Developing the solution can be defined as providing the necessary infrastructure necessary to enable the benefit delivery process.

directly supporting the delivery to the internal customer, and ultimately the external customer as well. This is the area of operations and technical support. The second delivery consists of support services necessary to the fulfillment of the primary benefit. This track consists of accounting, EDP, or human resources, which have a less immediate and supportive role in the delivery process. This dichotomy requires different delivery techniques.

Strengths and Weaknesses of the UBS Approach

As with any organizational approach chosen by a firm, there are strengths and weaknesses that must be considered. This is also the case with the hybrid approach chosen by UBS. Direct logistics support is organized using the offering-based model, and indirect logistical support is organized according to the responsive model. This section will evaluate some of these issues and provide a context for future analysis.

First, the direct operational support of the foreign exchange and other front-line processes tend to optimize the single process, which may be at the expense of the total organization. Individual, technology, and other assets are dedicated to foreign exchange, just as other direct logistics assets are dedicated to other business products and processes. The optimization of the single units may be at a cost to the total organization, given economies of scale, or technological assets that could be shared by the groups.

While this at first glance may appear to be a major weakness, it is in

reality one of the ways the organization has established itself to be flexible and responsive in the market. Each of the units is capable of dramatic technological change, with little regard of its impact on the rest of the firm. As has been demonstrated earlier, when foreign exchange began the process of selecting a new software support package, it consisted of a team of those individuals impacted by the change. This team did not consist of other front-line personnel, for they were not and would not be impacted by these changes.

The trade-off that must be considered here then is the need to be flexible against the cost of sub-optimizing the whole organization. The cost of being inflexible and confined to a specific system or operating procedure in a dynamic market may be far greater than sub-optimizing part of the process.

Second, as an organization becomes more transparent and allows the various business units greater degrees of autonomy, it becomes more difficult for the corporate office to dictate the overall strategy and vision for the organization. This is especially true when the reward structure is based on unit performance, and not conformance to the firm's overall strategy.

Inadvertently, this move towards greater autonomy has been aided by the effectiveness of the logistics division. Its ability to disaggregate data for the individual product lines has made the front line more visibly accountable for their own performance. Corporate management must now

more carefully weigh the importance of its actions on the front line.

Third, this approach may over time have a tendency to focus the attention of the logistics support on the internal customer, to the detriment of the ultimate external customer. This would bring logistics back to the early 1960's where the discipline was defined in terms of how it served the organization in maximizing short-term and long-term profits. The initial customer is indeed the front office, but the hidden, judging customer is beyond the boundaries of the organization. The "who we serve" and the "what we do" for the front line must be tempered with the "why we do it," that is, for the final customer.

This disadvantage can be negated, as observed at UBS, by continued education of the work force. Employees working in support roles must be reminded, as do managers, that the organization serves a customer that they do not always see or hear. This can be done by explaining how the employees' jobs impact the service the customer receives, as well as education on the use of the various financial tools used by the Bank's customers.

This hybrid approach also has several advantages. First, both direct and indirect logistics support have a better understanding of who their customer is and the importance of supporting the front line in their efforts. Potentially, this translates into less conflict between the various logistics departments. The mission of the Division is to support the front line; this

then serves as the central organizational theme and approach to product development and support.

Second, the level and amount of communication between the various divisions within logistics and the front line are much higher. In the case of the new software package to be implemented by UBS, all concerned parties fully understood the project. The level of knowledge was not superficial, but mirrored continued communication on the status of the project.

Third, the organization has an ability to quickly respond to meet the needs of individual customers. This is done by standardizing the interaction between the divisions as well as the infrastructure supporting the organization. Standardizing the type of computers used, as well as software, increases the ability of the firm to transfer information globally. Internally, communication is facilitated by effectively using coordinators and liaisons to diagnose current and future needs.

Summary

This analysis has illustrated the role of logistics in the wholesale banking industry represented by UBS. Logistics can be defined as everything that supports the front line. In order to provide that support, different methods must be utilized. This includes the use of a product-based model for the primary logistical activities and the responsive model for indirect logistics.

The case study focused on the foreign exchange process. While it is true that each process in the Bank will be different, the methods used to support the mission of the front line will not differ. In other words, the use of liaisons, coordinators, and technological standardization is independent of the particular application. Additional findings and comments will be made in Chapter 8, which is a comparative analysis of the different industries.

CHAPTER 7

LOGISTICS IN HEALTH CARE

Introduction

A student in an evening MBA class at the University of Tennessee who worked as an RN in an area hospital was discussing some of the issues facing nursing professionals. During a class discussion with the researcher she mentioned that just that day the hospital had lost a patient. Her fellow students murmured their sympathy and understood that not all patients are cured or saved from their ailments. The nurse quickly responded, "No, you don't understand, we LOST the patient–for four hours!" It seems that the patient had been taken from his room for testing and never returned.

This is not an isolated incident. After relating this story to some executives in a different part of the country later that year, one of them mentioned that the same thing had happened at a hospital where his wife was an RN. A patient in a Nashville hospital recently patient wandered into a restricted area and was found dead several days later.[1]

Many in the logistics and transportation field can relate to losing or damaging a shipment. But this is insignificant in relation to losing a patient, let alone one who may require critical care. These incidents impact

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[1]Schmitt, Brad "Missing patient's body found in hospital corner" *The Nashville Tennessean*, July 29, 1993, Section A, p. 1.

the quality of care provided by the institution. It is important to see how the health care field views quality to grasp the overlooked role of logistics in the delivery process.

This case study will explore some of the logistical issues facing a hospital today. This will be done by examining a diagnostic floor, an operating room, and a pharmacy. These processes will be compared to the normative model as described in Chapter 4 and further developed by the interviews with health care providers, as well as the application of case management. The data was gathered over a seven–month period from four regional hospitals and reflects a composite of the practices utilized by these organizations.

Quality in Health Care

The quality of health care can be divided into three parts: process, outcomes and structure. According to Donabedian, logistics would fall in the realm of structure. Logistics enables the health care providers to deliver the care as needed to the patient. "Process" refers to a "set of activities that go on within and between practitioners and patients."[2] The most direct method for assessing the quality of care is to directly examine

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[2]Donabedian, Avedis *Explorations in Quality Assessment and Monitoring, Volume I: The Definition of Quality and Approaches to its Assessment,* Heath Administration Press: Ann Arbor, Michigan 1980, p.79.

that care. Two indirect methods are also possible–the study of "structure" and "outcomes."[3]

One of the indirect approaches to studying quality is outcomes, which means a "change in a patient's current and future health status that can be attributed to antecedent health care." These changes can be improvements of social, physical, or physiological in nature. In addition, changes in a patient's attitude, "including satisfaction" or behavioral change, would be included in the definition of outcomes.[4]

"Structure" refers to

> ... the relatively stable characteristics of the providers of care, of the tools and resources that they have at their disposal, and of the physical and organizational setting in which they work. The concept of structure includes the human, physical, and financial resources that are needed to provide the medical care.... Structure includes the organization of the medical or nursing staff in hospital, and the presence or absence of a quality review effort, as well as its characteristics, in all their detail. The basic characteristics of structure are relatively stable, that it functions to produce care or is a feature of the 'environment' of care, and that it influences the kind of care that is provided.[5]

For Donabedian, a hospital exhibiting the traits of good structure is more likely to be able to support high quality care, while a facility with little

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[3]Ibid., p. 81.

[4]Ibid., pp. 82-83.

[5]Ibid., p. 81.

indirect evidence of the features of good structure are less likely to support the delivery of good quality care.[6]

In an earlier work, Donabedian described characteristics of these three variables that could be used in assessing the quality of care. The characteristics of structure are provided in Figure 7–1.[7]

There are no measurements of how each of the parts of structure should accommodate care. It is important to know what constitutes quality resources, but it is equally important to know how these resources need to be coordinated and integrated.

For instance, an organization may have all of the ingredients of success, but still not be successful. An analogy would be a recipe for a cake; while twenty people may use the exact same ingredients, each of those twenty cakes could taste differently from the other. It is not a matter of what ingredients were used, or how much, but how and when they are integrated with each other. This is the soul of logistics in health care: coordinating activities that facilitate patient care. Examples of how it is done are provided in the following sections.

Logistics does impact the delivery of care, as well as the satisfaction experienced by the patient. A survey done at Park Nicollet Medical Center surveyed patients on twenty three likely causes of dissatisfaction with

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[6]Ibid., p. 82.

[7]Donabedian, Avedis "Promoting Quality through Evaluating the Process of Patient Care," *Medical Care* Vol. 6, 1968, pp. 181-202.

I. Characteristics of the Setting within Which the Medical Care Process Takes Place

It is assumed that good care is more likely to be provided when the settings are favorable, and that we know what constitutes a "favorable" setting.

A. Physical Structure, Facilities, and Equipment
    1. Presence or absence of certain facilities and equipment in relation to specific care functions
    2. Space and physical layout in relation to function
B. General Organizational Features
    1. Ownership and auspices
    2. Profit or nonprofit status
    3. Accreditation, affiliation, and residency approval status
    4. Other interinstitutional functional relationships (for example, as part of a regionalization program)
    5. Group practice, partnerships, "solo" practice
C. Administrative Organization
    1. Boards of trustees: their composition and activities
    2. Administrator: qualifications and relationships with board and staff
D. Staff Organization
    1. Qualifications: formal degrees; certification, experience, etc.
    2. Number of staff related to work load
    3. Staff organization and policies governing staff activities
        a. Educational functions: maintenance and promotion of staff competence
        b. Control functions: utilization review, various types of audits of staff performance, etc.
E. Fiscal and Related Aspects of Organization
    1. Hospital accommodation
    2. Source of payment of bill and extent of patient participation in payment
F. Geographic Factors; distance, isolation, etc.

Figure 7–1
Characteristics of Structure
Source: Donabedian, 1968

ambulatory care. The most frequent responses, in order were 1) Ability to get through on the phone, 2) communication about new services, 3) ease of getting an appointment, 4) waiting time in reception area, and 5) waiting time in examination room.[8] The implementation of service response logistics principles would benefit each of these five areas.

Diagnostic Floor Operations

The purpose of this section is to review the actual operations of a diagnostic floor in a medium-sized health care facility. These tasks can be positively impacted by the study and application of both supply chain logistics and service response logistics. A Vice President of Patient Care commented after an interview that "I never realized how interested I was in logistics."

Usually each floor and wing of a hospital is dedicated to a specific diagnosis or treatment. For instance, a wing may be dedicated to surgery patients, another to critical care, oncology, or diagnostics. Patients with similar needs and treatments are grouped to facilitate physician rounds, equipment utilization and support staff expertise.

Much of the data gathered in this section are based on observing a wing dedicated to diagnosing patients; the patient may be in the hospital for two or three days and undergo a battery of tests to determine a treatment

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[8]Berwick, Donald M., Godfrey Blanton and Jane Roessner *Curing Health Care: New Strategies for Quality Improvement*, (Jossey-Bass Inc: San Francisco), 1990, p. 53.

plan. In some instances overflow patients were there to be prepared for surgery or for recovery directly after surgery (post-op).

It should be noted that overall patients in the hospital have a higher average acuity level than even a decade ago. This is due to the increasing use of out-patient surgery, which has been facilitated by advances in technology. For instance, a gallbladder that may have taken as long as ten days several years ago can be done as out-patient surgery today. This increases the ability of the hospital to serve more patients and reduces the costs of caring for a patient who is able to recuperate at home. However, there is a greater burden placed on the nursing staff since the most of the patients require a great deal of personalized care. Instead of having a mix of patients with varying degrees of needs, all of the patients are in need of a high level of attention.

Depending on the type of floor, there may be between fifteen to thirty patients or rooms on a wing. Each wing consists of charge nurse, a unit secretary, registered nurses (RNs) and some type of RN support, in this case referred to as Patient Care Assistants (PACs). The charge nurse is responsible for scheduling and managing the number of RNs and PACs on the floor. The number of RNs and PACs is dictated by the number of patients already on the floor and those scheduled to arrive during the course of the day. If there are too many RNs scheduled for the floor, an RN may be asked to work on a different floor or asked to go home.

For many hospitals it is difficult to accurately determine the actual number of nurses that will be needed on a given shift. Long-term scheduling (one month out) can be done based on historical data. The impact of holiday and other seasonal factors are also considered. For instance, elective surgery is not normally scheduled during Christmas or Thanksgiving since most patients, and physicians, would rather be at home with their families. In addition, in many instances the charge nurse is not aware of scheduled admittances to the hospital until the day before the actual procedure. This may be the case even when the surgery has been scheduled in the operating room several months in advance.

Each nurse is scheduled a block of rooms that he or she will be responsible for until the next day off. For instance, a nurse working a five day, eight-hour shift will be assigned the same patients for those five days. This minimizes the number of care providers interacting with the patient and allows for a more dedicated delivery. It also minimizes the new people a patient sees each day while in the hospital. One respondent said that an average patient will come in contact with over twenty five different hospital employees each day of his or her stay.

Along with the charge nurse is a unit secretary who is responsible for maintaining the patient charts, ordering meals and tests, and relaying patient requests to the appropriate RN or PAC. Each of these

responsibilities will be discussed in turn, for each of them have direct applications to logistics and the quality of the care delivered.

Patient Charts

One of the responsibilities of the unit secretary is to update the patient charts. Patient charts contain the written documentation of all that has happened to the patient, along with the doctor's orders regarding treatment for the patient.

When a physician starts his or her rounds, the patient charts are located at the unit secretary's desk. This is located in the most central part of the floor or wing and serves as the hub of most activities. Physicians, upon consultation with their patients, will write "Progress Notes" on how the patient is progressing and may order additional tests, drugs, or therapy. Upon completing rounds the physician returns the charts to the unit secretary. The unit secretary types the pharmacy orders on request forms, updates the treatment plan, and enters it into the hospital's information system.

In many hospitals the doctor's "Progress Notes" have multiple copies since orders for tests or drugs are ordered on this form. However, the physician's comments on the lower copies are blanked out, making it impossible for anyone else to see how the patient is doing. Some physicians have resorted to using felt pens to make the duplicate copies worthless. The

reason for this behavior, as described by one pharmacist, is that physicians believe that "it's my patient, and it's none of your business how the patient is doing."

After the unit secretary has entered the information from the patient chart into the hospital information system, the RN assigned to that patient must review the work of the unit secretary, and initial that the secretary entered the data correctly. This requires the RN to log onto the information system, retrieve the patient's history, and compare it to the actual patient chart. If it is correct, the RN physically initials the forms in the chart. This system serves as a double check to ensure that tests and treatments are performed on the proper patient.

Ordering Patient Tests

How tests are ordered and how the samples are drawn varies with the type of test required. A simple blood test may be drawn by the laboratory, while a sample of spinal fluid could be drawn by the admitting doctor. Interestingly, when there are multiple physicians as in the case of critical care, each physician may order several tests requiring samples being drawn from the patient.

When a test is requested by the physician, it is entered into the information system by the unit secretary. The order is sent to the lab, printed, and a laboratory technician is routed to obtain the sample. After

the technician completes their rounds the samples are taken to the laboratory for analysis. The results are up loaded in the hospital's information system and are also printed on a printer located near the unit secretary. The printed results are placed in a file above the printer, where the physician can retrieve prior to making rounds. If the order had been requested "STAT," the physician would be called and given the results of the test over the telephone.

Each of the tests are ordered using the patient's room number as the key identifier. If an error is made in entering the wrong room number, it is normally caught by the RN when the records are reviewed. However, a test may be entered into the information system incorrectly, and a technician dispatched to draw the sample. If the technician leaves before the correction occurs, unnecessary samples will be drawn from the patient. Or a sample may be sent to the lab with the incorrect patient information, requiring a new test be done.

This process highlights another important determinant of health care, lead time. In many instances lead time is considered to be the time it takes a test to be completed after it is requested by the lab. However, this only captures a potentially small segment of the actual lead time.

As illustrated in Figure 7–2, lead time begins when the physician orders a particular test for a patient. The next step in the process takes place when the unit secretary enters the request onto the information

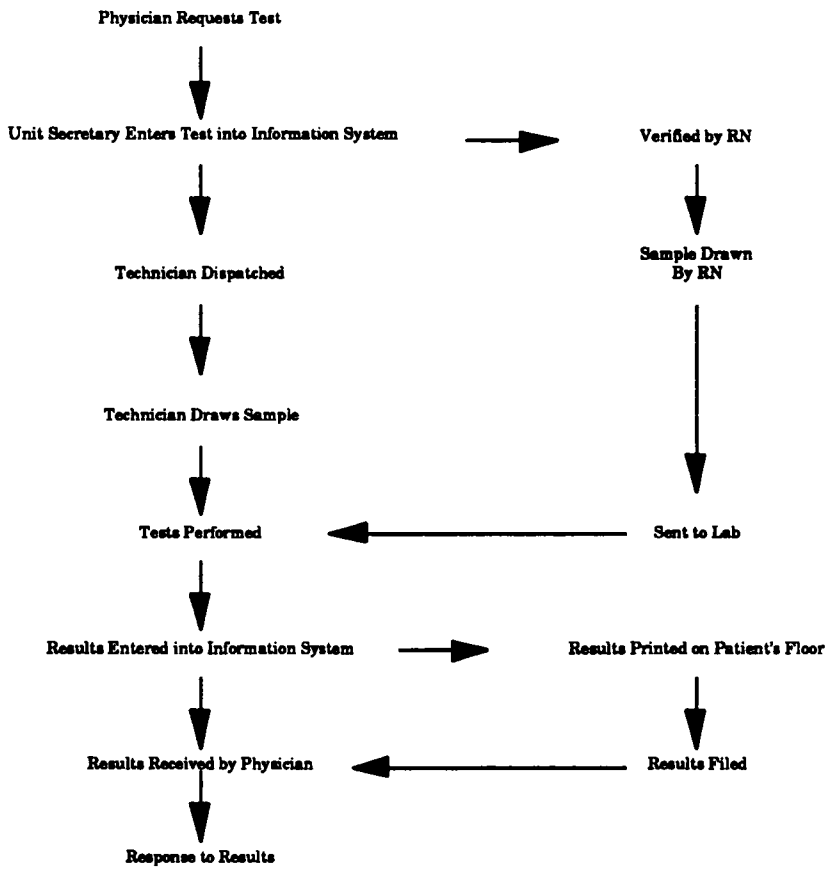


Figure 7–2
Total Lead Time of Laboratory Test

system and it has been reviewed by a RN. Next, a blood or tissue sample is extracted from the patient, and the sample taken to the lab. The sample is analyzed, and results are printed and catalogued by the unit secretary. Finally, the physician retrieves the information and acts on that information. This may occur when the physician makes their afternoon rounds, or when he or she starts rounds the next day. Total lead time is the elapsed time from the request for information or treatment until the physician takes action on that information.

In some instances a sample may not be required of the patient, as in the case of an X-ray or treatment by a physical therapist. Instead of requesting a test, the unit secretary notifies the other department, which schedules the patient for the procedure. Total lead time ends when the physician acts on the results of the treatment.

Unfortunately, total lead time is not defined in this manner in any of the hospitals examined. Rather, a piecemeal approach to improving each of the pieces as taken; that is, reducing the time it took to perform a certain test and report it to the nurses station. If the laboratory is able to reduce the time necessary to perform a test by fifty percent, it is still a much smaller piece of total lead time.

Managing Patient Requests

When a patient has a need of any kind, he or she uses a call button attached to the side of the bed. These needs vary significantly, from the request for more ice chips, to pain medication, to bandage changes as a result of excessive bleeding of a wound. Unless the request is life threatening, it is written on a white board behind the unit secretary's desk by the unit secretary. The patient's room number and the request is written on the board. This serves as the mechanism to dispatch the nurse to the patient's room. If the request is simple, a PAC may respond; if the request is for additional medication, an RN is required. When the request has been satisfied, the request is erased by the person who responded to the patient's need.

RN Rounds

The RNs begin the day with "review," which are comments taped by the previous shift RNs concerning the care the patient has received the past eight hours. These comments discuss some of the tests run on the patient, prognosis, and at times the general disposition of the patient. It allows the RN to communicate the patient's needs to the next shift in a short period of time.

After the review has been completed, each of the RNs begins the shift with dispensing medication or meals. On the morning shift, which started at 7:00 a.m., the RNs attempted to complete these tasks by 9:00 a.m.

Depending on the hospital, patient medication is delivered to the floor either late at night or early in the morning. Medication is placed into small plastic bins labeled with room numbers and arranged on the cart by wing. Each bin contains one day's supply of medication, except for narcotics, which are locked and kept by the unit secretary in the pain room. When the medication is administered to the patient, the RN logs the information into the "pain book," noting the time the drugs were administered. Additional medication that was given to the patient per the physician's orders were handwritten and entered into the system by the unit secretary. Discontinued medications were also noted and entered into the system. This updated the medication needs for each of the patients on a daily basis.

After the patients had been fed and received initial medication, the RNs cared for the needs of the individual patient as quickly as possible. They must keep track of when dressings have to be changed or when medications have to be administered to the patient. They are expected to interact with the physician on the care and condition of the patient and educate the patient on his or her own care. Nurses had to document what was taught to the patient and the amount of time that was spent during the shift on that goal.

Pharmacy

Pharmacy plays a critical role in the care provided to the hospital's patients. How much of a role varies at each institution; in a teaching hospital, the pharmacist and physician may train together, and many of these physicians rely heavily on the pharmacists when they start their practice. In some instances the physician may even request the pharmacist to go on rounds with the physician.

This section will describe the indirect logistics support used to deliver medication to the floor of the hospital. This is a critical logistics issue, more properly analyzed under supply chain management. For instance, one participant in the research stated that for each dollar spent on medication, another four to six dollars was spent delivering and administering the medication to the patient. Another study has placed the direct logistics cost, excluding the cost of delivering supplies at another seventy cents to one dollar for each dollar spent on supplies.[9] A study released by the Health Industry Distributors Association in 1990 found that "Supply costs may account for as much as one-third of a hospital's operating budget."[10] Innovative methods are currently being used to reengineer this delivery process and will be discussed later in this chapter.

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[9]Wagner, Mary "Stockless Inventory: Some Say it's a Hot New Innovation, But Skeptics Don't Put Much Stock in its Claims" *Modern Healthcare*, Vol. 20 No. 13, April 2, 1990, p. 22.

[10]Wagner, Mary "Study Finds Stockless Inventory Saves Money, But Many Barriers Keep it From Gaining Favor", *Modern Healthcare*, Vol. 20 No. 40, October 8, 1990, p. 44.

After the unit secretary completes a new patient's chart he or she will send a copy of the doctor's order for medication via an air tube system, by electronic message, or both, to the pharmacy. If the request is an emergency, the unit secretary will contact the pharmacy by telephone. When the order is sent manually it is entered into the pharmacy's information system, and the order, packing slip, and label are printed. A technician is dispatched to fill the order. After the drug(s) has been picked a pharmacist is responsible for validating that the drug(s) picked match the a picking slip and label. The pharmacist also validates that the drug is in the proper dosage and in the medium requested by the physician (for instance, oral or intravenous). This verification is entered into the pharmacy's system. The medication is then delivered to the nursing station. Depending on the time of day and the medication requested, it may be delivered through an air tube system, by a technician, or delivered in the early morning with the next day's supply of medication.

When the patient is not new and the pharmacy has a record of the medications required by the patient, the next day's medications are picked during the evening shift and delivered to the floor either late at night or early in the morning.

Not all drugs that are requested by the physician will be used by the patient, resulting in drugs being returned and restocked. This is was most often the case for patient requested medication, where a physician will

allow a patient to take some medications, such as Tylenol or aspirin, if the patient needs it. One pharmacist found that only six percent of these drugs were being administered to the patient. Ninety-four percent of the medication was returned and restocked. To solve this particular problem, this type of medication was kept at the nurses station and replenished on an as-needed basis.

Clearly, pharmacists must be able to successfully manage the inventory of drugs on hand, from those costing only a few pennies a dose to those costing several hundred dollars. The fill rate must be one hundred percent since the cost of the a stockout is high. At the same time, the amount of inventory held is dictated by financial considerations, expiration dates of the medication, and physical space required to store the needed drugs. The best logistical methods must be employed to pick and pack the drugs without any errors. These methods must comply not only with internal quality standards, but those set by the state and federal government. Finally, the drugs must be routed and delivered in the most effective and efficient manner.

To alleviate some of these problems, some drug suppliers, linked by electronic data interchange (EDI) with the hospital, are delivering the medication directly to the hospital floor, sorted by room number. This bypasses the main pharmacy and the associated costs.[11]

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[11]Wagner, Mary, "Vanderbilt's Stockless System Relies on Distributors as its Materials Managers" *Modern Healthcare* Vol. 20 No. 5, February 5, 1993, p. 44.

Unfortunately, while there are some outstanding examples of logistical excellence in this area, it is the exception, and not the norm. Many of the pharmacists and materials management staff interviewed in this research used the most basic ABC method to determine inventory levels. In addition, there was little recognition of logistics. One pharmacist asked the researcher what logistics is, and when it was defined, he commented, "That's great. You know, I always thought there was someone like you out there that was interested in these issues, but I just didn't know who they were."

Operating Room

As illustrated in Figure 7–3, managing the operating room process is rather complex. This process begins with booking the case, or patient, with the operating room. This is normally done by the admitting physician's secretary, who contacts the operating room directly. Next, pre-operative testing is to be completed. These tests are scheduled either by the operating room scheduler or the physician's office. Finally, the surgical unit must be prepared for the operation.

In the hospitals studied, the methods used to book the operating room varied significantly. One institution used a database that managed each of the operating suites. Another hospital pencilled the physician's request in a

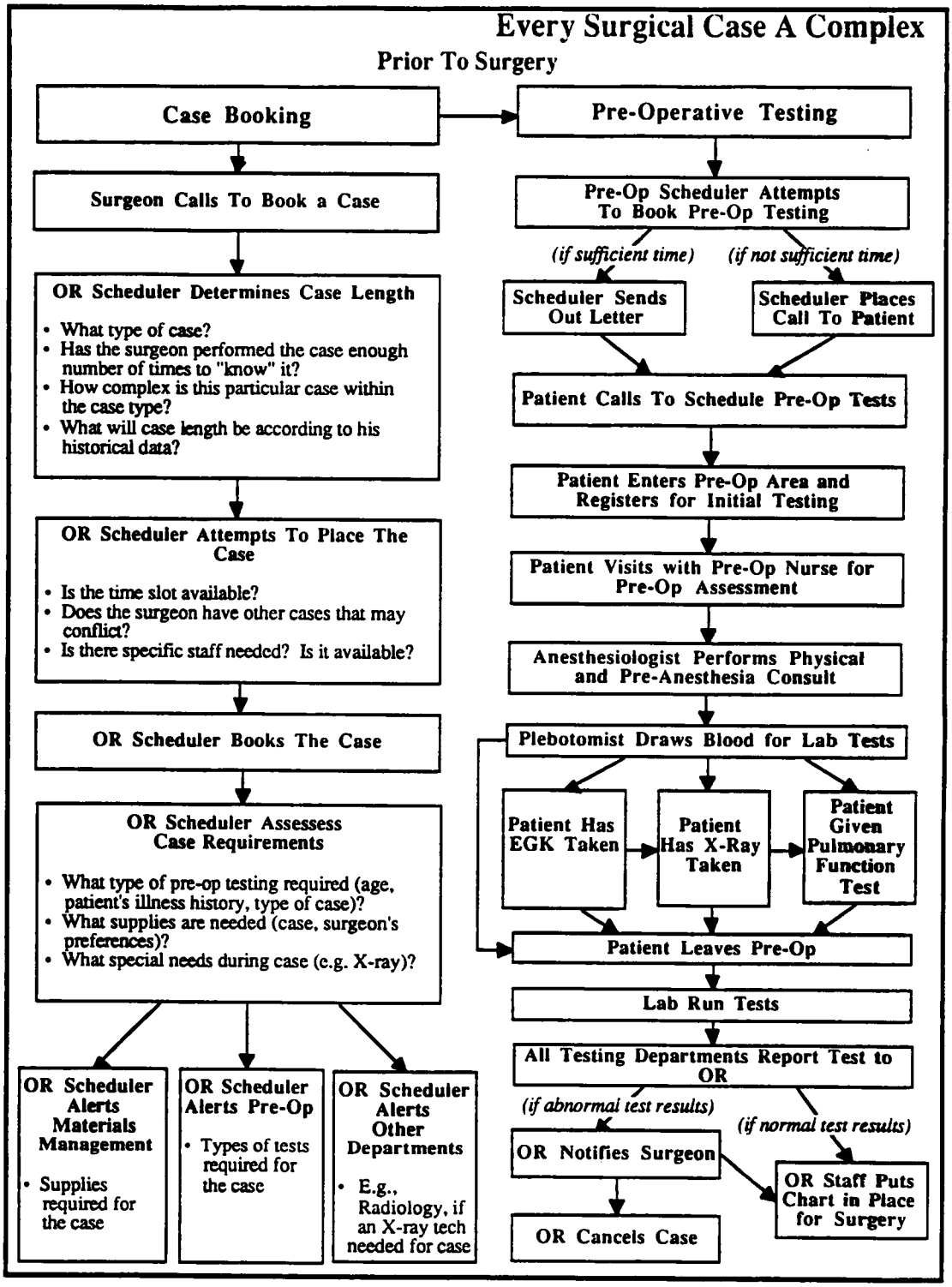


Figure 7–3
Every Surgical Case a Complex Manufacturing Process
Source: *The Advisory Board*, 1993

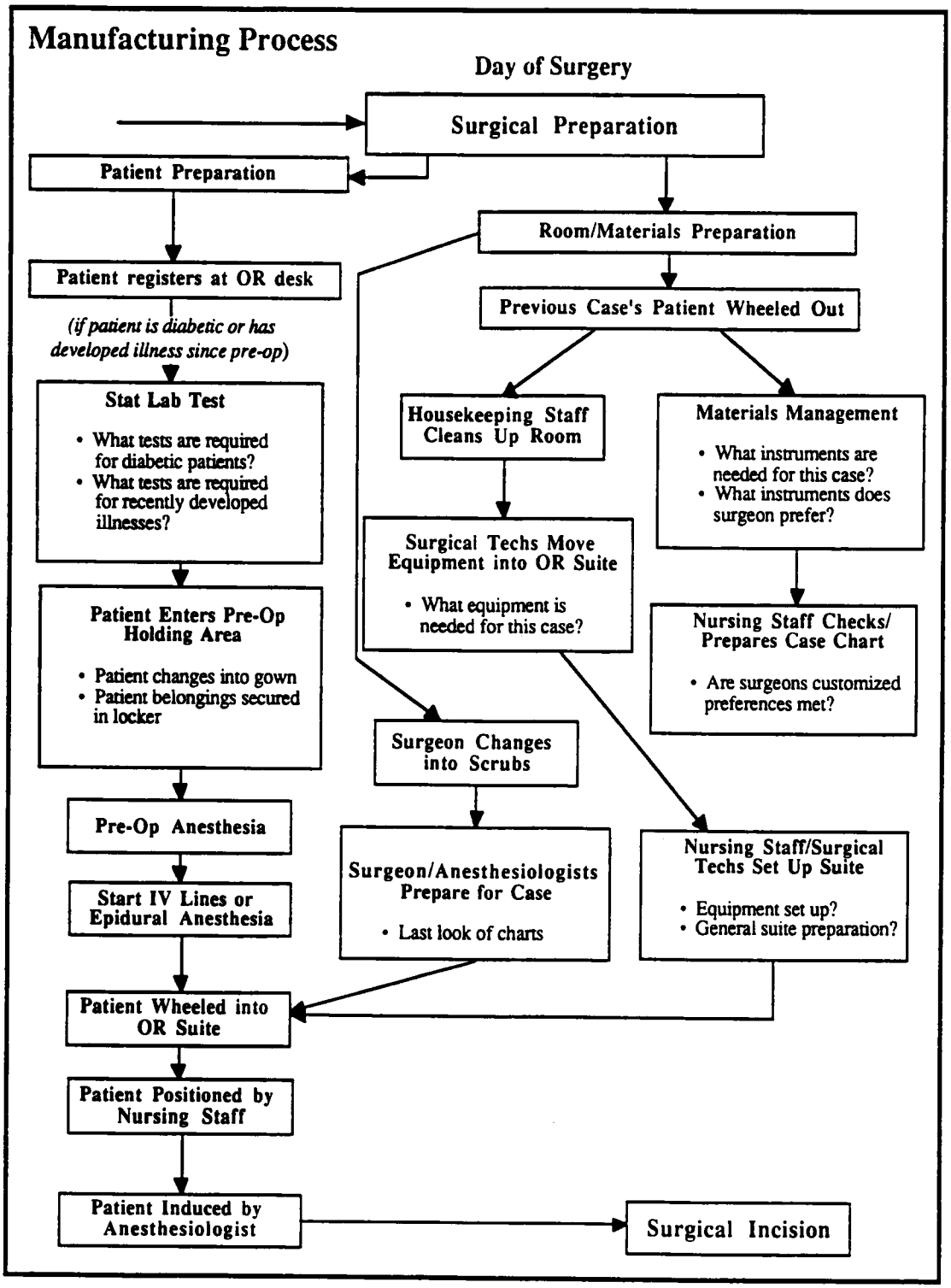


Figure 7–3 Continued
Every Surgical Case a Complex Manufacturing Process
Source: *The Advisory Board,* 1993

large ledger, which was reviewed a few days before the surgery to confirm the dates and times.

The variation in these processes is not limited to the presence or absence of technology. One research team has found that, "In health care, because `processes' often are not consciously designed to begin with, it is not unusual to find that they are inconsistent across units and across time."[12] Processes studied also vary by the perspective taken by the researcher, that is, whether they are studying the process from the perspective of the patient, the physician, or the hospital. Another example of a surgery flow process is found in Figure 7–4.

Many surgeons have preferences not only on the type of instruments to use for a particular surgery, but also the time and day they operate, a particular operating room, layout of the instruments, and staff members used to assist them in a procedure. These preferences are kept on a "preference card," which tracks the surgeon's requests. In some cases these are physical index cards; in others, they reside in an information system.

These cards are used to build surgical carts that contain the necessary instruments and materials required for a procedure. For instance, a gall bladder operation requires a standard set of instruments. In addition to this standard set, a physician may request other instruments.

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[12]Berwick, Donald M., Godfrey Blanton and Jane Roessner, ibid., 1990, p. 94.

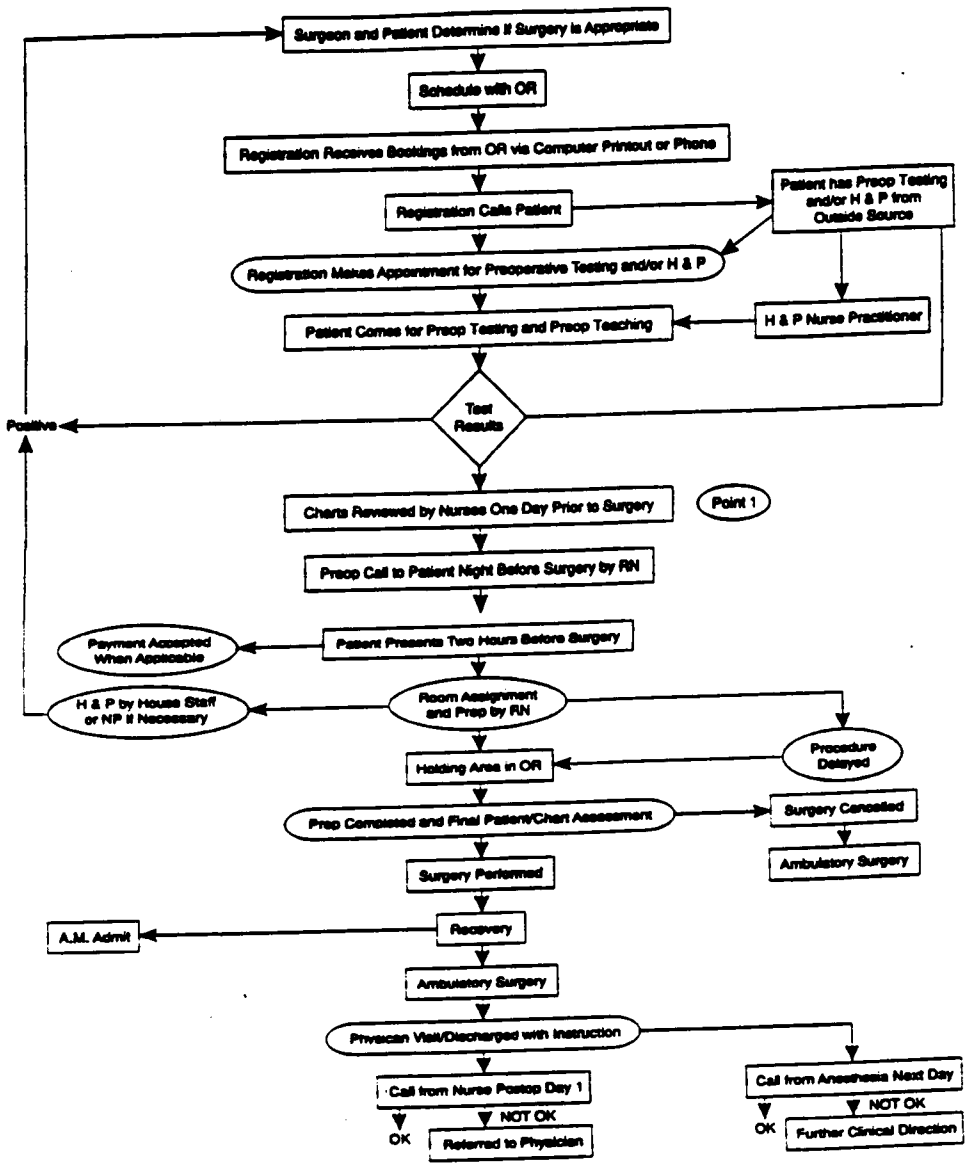


Figure 7–4
Ambulatory Surgery Patient Flow
Source: Berwick, Godfrey and Roessner, ibid., pp. 90-91.

For instance, disposable clamps may be requested over the standard set of clamps provided. The instruments are sterilized and placed in a stainless steel cart. The other materials needed in the procedure are also placed inside the cart and then staged near the operating room. The cart will be brought into the OR prior to the procedure, unpacked, and laid out according to the preferences of the physician. After the procedure the cart and its contents are sterilized.

Materials that were not used are re-stocked. Billing the patient for the materials used is based on exceptions to the physician's preference card; exceptions refer to those materials, if any, that are re-stocked.

The process of building the carts is normally done the day or night prior to the operation. One hospital began building carts after 3:00 in the afternoon and completed the process prior to midnight. Their experience had revealed few changes to the OR schedule after three in the afternoon.

When the testing can be done in advance of the surgery, the patient is scheduled to come in for those tests needed to be done at the hospital. Test results are forwarded to the surgeon. When testing cannot be done in advance, or if the results are not received by the surgeon, a stat lab will run the tests on the patient.

There are, however, several fail points that impact the logistics of delivering care to the patient in an effective and efficient manner. These

fail points are institution specific, and as such were not observed in each of the hospitals studied.

The duties of the OR scheduler vary between hospitals. In some cases they are responsible for scheduling the patient with Admitting and in other cases are not. When the OR scheduler is not responsible, it is up to the physician's nurse to make the necessary calls to schedule the patient in Admitting, as well as any pre-operative tests.

In many cases the information that the OR scheduler receives remains within the OR, at the detriment of the rest of the hospital. OR was normally alerted of the materials needed for a procedure a day before the surgery, even though the patient may have been scheduled for two or three months. Materials management must rely on forecasts of need, even though many of the data points are determined and scheduled. In other words, instead of forecasting for one hundred percent of the OR cases, materials management would only have to forecast thirty to forty percent of the cases on a monthly basis.

Figure 7–3 provides a normative model of the coordination of the operating room. First, under the section "Case Booking," one of the OR scheduler's duties is to "alert" materials management on the supplies required for the case. In addition, they are to "alert" other departments, such as Pre-Op and Radiology. However, in some of the hospitals examined, it was the responsibility of the admitting surgeon's nurse to call admitting

and schedule the patient's room, and call Pre-Op to schedule the testing as well. In addition, materials management did not receive the information on the specific procedure to be done that day until the night before. This lack of timely information requires materials management to maintain higher levels of inventory than would be expected. Anthony Kesman, Vice President of ValueLink, Baxter's stockless inventory program has stated that, "Inventory is the price (the hospital) pays for lack of information."[13]

This was highlighted by observation of two different operating room suites. At one hospital new operating room suites had been opened a few months before. One of the design characteristics of the new suite was that there were no storage room facilities for the OR for materials such as suture, bandages, pacemakers, or artificial joints. These items were to be stored on the floor below the operating room suite. Prior to moving, the inventory in the OR was approximately one million dollars. After the move, and without dedicated storage facilities, the inventory in the suites increased by over fifty thousand dollars.

In fact, this should not be surprising. A GAO study of federally run hospitals found that "'unofficial inventory' was as high as two to three times the amount of inventory held in approved hospital storage locations." Baylor University Medical Center estimated their unofficial inventory at

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[13]Wagner, Mary, Ibid., April 2, 1990, p. 26.

$6.1 million, compared to an official inventory of only $2.3 million.[14] This inventory was hidden in the ceiling tiles, hidden in a desk, or in a file cabinet. The reason for this behavior is not malicious, but rather one of guaranteeing that the surgeons receive the materials and instruments they want, when they want them.

Much of this inventory is small, but high value. For instance, a box the size of a cardboard egg crate would hold suture worth over nine thousand dollars. A small cupboard, five feet by three feet, with four shelves held artificial joints costing more than six hundred thousand dollars. Many of the artificial joints had been in the OR for over two years. Another portable cart's bottom shelf contained twenty pacemakers, priced at over ten thousand dollars apiece.

Second, data transfer between the various departments or specialties in the hospital is at best haphazard. Each department has its own software or information system that lacks the ability to interface with the rest of the organization. One software vendor who recommended a scheduling package for an OR was asked if the package would allow inputs from Admitting. The vendor quickly responded that it did not and that the data from Admitting would only "contaminate" the OR's data.

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[14]*DOD Medical Inventory: Reductions Can Be Made Through the Use of Commercial Practices* United States General Accounting Office GAO/NSIAD-92-58, December 1991, p. 19.

This is not to say that monies and effort are not being placed in up-grading the hospital's information system. In fact, it is. One hospital had committed over one-half of its yearly profits to upgrading its information system. However, in many instances these up-grades are department specific and do not possess the cross-functional capability needed to manage the coordination of multiple activities.

Third, there is no financial reward or penalty associated with how the non-salaried physician utilizes the hospital's capacity. For instance, a procedure that may take one hour in the OR for one surgeon may take two hours for another. Yet, both procedures are being reimbursed the same amount by the insurance carrier. The cost difference is the responsibility of the hospital, and not the slower surgeon.

While it is acceptable for the surgeon to take time in performing a specific operation, there are other times that the operating room's capacity is reserved at great expense for the particular hospital. In one instance observed by the researcher, a surgeon was scheduled to perform open heart surgery early in the morning. The OR was prepared, the staff assembled, and the patient brought down to the holding area. The physician had not arrived and was called to find out when the surgery would begin. The surgeon was found in another hospital completing another procedure, which he said would only take a few more hours. The surgeon flatly refused his partner, who was already at the first hospital, from performing the

operation. The surgeon failed to arrive by noon, and after waiting over seven hours the patient was re-scheduled. This resulted in a potential revenue loss of nearly ten thousand dollars in wasted scheduled capacity, not including the cost of the waiting staff.

Some might argue that the physician should be responsible for the lost capacity. Yet, if the physician were charged, he or she would merely refer their patients to another hospital. The cost of lost capacity is lower than the threat of losing a surgeon.

This problem highlights the fact that over eighty percent of a hospital's capacity is determined by nurses and physicians.[15] This means that a hospital must provide the necessary infrastructure to meet the needs of its physicians, with little regard as to the cost of providing the requested service. If a hospital in one market refuses to cater to its physicians, the physicians, and their patients, will go elsewhere.

Model Development

In many cases the model described in Chapter Four describes the normative process of delivering care to the patient. The qualifier in this research model is the word "normative," in that reality varies greatly from this ideal.

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[15]McKenzie, Claudia B., Natalie G. Torkelson and Margaret A. Holt "Care and Cost: Nursing Case Management Improves Both" *Nursing Management*, Vol. 20 No. 10, October 1989, pp. 30-34.

An appropriate place to start in the model is identifying the customer. It may be the patient, the insurance company, the patient's employer, or even the physician. In many intensive care units a patient may have multiple doctors, further complicating the determination of the customer. Each of these cases will be discussed in turn.

Patient as the Customer

Figure 7–5 begins with the primary customer, the patient. The patient interacts with the physician, who diagnoses the needs of the patient, and determines if more data or tests are needed to restore the patient's health. These tests or procedures are recorded in the patient's chart, which becomes the to-do list.

It is the responsibility of the hospital's RN to route the patient through the delivery care process. The RN verifies and coordinates a patient through the various internal support services. These may require the patient to go to the OR, then Physical Therapy, and X-Ray. In addition, the RN may be responsible for coordinating external support services such as the Red Cross, the Arthritis Foundation, nursing homes, hospice, or other organizations that can care for the patient when they leave the hospital.

Not only are the RNs responsible for coordinating the treatment plan for the patient, they are also responsible for responding to the immediate needs of the patient. These needs may be for additional medication or

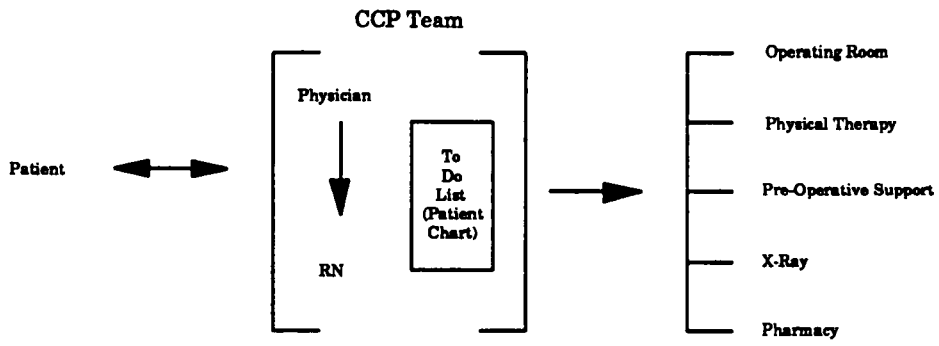


Figure 7–5
Patient as the Customer

attention to personal matters. These tasks can be delivered by the RN or PAC, or by another support group under the guidance of the RN.

In these cases the customer contact person (CCP) is not a single admitting physician, but rather a team of professionals working to deliver the requested benefits to the customer. In the most simple case, the team could consist of the admitting physician and the hospital's RN. If the hospital does not internally coordinate a patient's admittance into the facility, the physician's scheduler is added to the CCP team. If the patient is in intensive care, with multiple attending specialists, these resources would also be considered part of the CCP team.

In addition to coordinating the direct logistics activities, such as the OR or Physical Therapy, RNs are key inputs for directing indirect logistics support. That is, they can direct the delivery of meals to the room, and make requests from housekeeping, as well as Pharmacy or X-Ray.

The goal of these activities is to make the delivery of care as efficient and effective as possible. The patient is not concerned with the manner in which different departments are coordinated, but rather that care is delivered effectively.

When the patient's procedures require the scheduling of different departments, coordination may be done internally by the hospital or externally by the admitting physician's staff. The physician's staff then would be responsible for coordinating the patient's arrival to the hospital,

and it would be the responsibility of the internal RN to coordinate activities after admitting.

The patient's chart serves as the to-do list for the CCP team. However, there are external protocols that must be considered in the routing process. This is particularly true where one test may influence the outcome of another test.

Physician as the Customer

The model is also appropriate when the physician is the primary customer. In those cases, the CCP becomes the Vice President or Director responsible for the department, and it is their responsibility to determine what tools and resources are necessary to support the delivery of care. This can be found in Figure 7–6.

In this instance it is the responsibility of the hospital's administration to diagnosis what the practicing physicians value. This may take the form of valued-added services or technologically advanced equipment or instruments. The goal is to determine what infrastructure is necessary for the efficient delivery of care.

This is becoming increasingly difficult to do, given the financial constraints facing the industry. New techniques or procedures to diagnose and treat patients may require significant financial investments. The

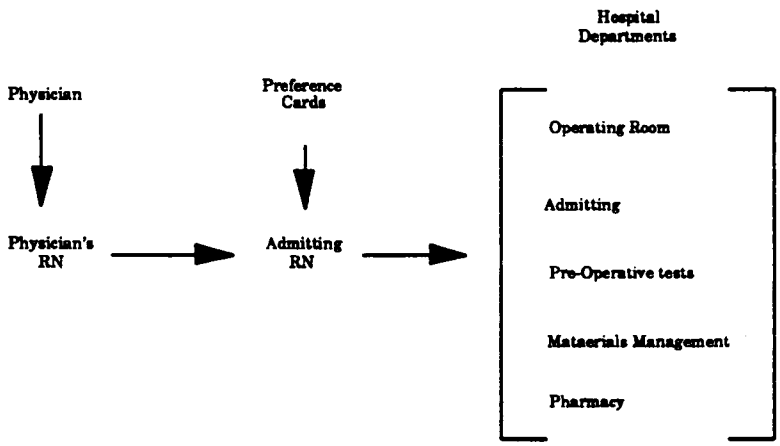


Figure 7–6
Physician as the Customer

hospital most willing and able to provide these new technical equipment advances, such as magnetic resonance imager (MRI), is best able to attract and hold its physicians.

Providing new technology, and using it, can also be viewed as a defensive position for both the hospital and physician, especially when the procedure is non-invasive. Given the present legal climate, physicians are better off performing multiple tests.

Summary

The purpose of the chapter was to show the importance of coordinating care for the patient. This was illustrated by activities on a diagnostic floor, an operating room, and the pharmacy. In many instances the coordination of care is the responsibility of the RN on the floor.

The role of supply chain logistics is indeed important to the delivery of care, and unfortunately the role of logistics is not well known in the health care sector. Traditional concepts and approaches to reducing inventory and increasing throughput will dramatically improve materials-handling efficiencies.

The role of service response logistics is not known. Even though RNs are by default responsible for the delivery of care to the patient, in many instances they are not trained in this area. In addition, where there are instances when the use of technology could benefit the coordination between

the different departments, the tendency has been to maintain functional silos. Many of the information systems encountered were either outdated or technically bound to their function. Electronic data across functions in many instances would have been helpful, but were not widely practiced in the institutions studied.

One of the underlying problems facing health care is that the patient moves through the health care process horizontally across the organization, while each of the specialties or departments are organized vertically. Information flows, and more importantly process flows, are disjointed and not well understood.

The model developed in Chapter Four helps to describe the role of the RNs in coordinating the delivery of benefits to the patient. The model in this chapter was modified to show the patient as the customer, as well as the physician as the customer. In the first case the RN serves as the CCP, coordinating both internal and external service elements.

This research also examined the role of case management on the delivery of health care. The purpose of case management is to better understand the process a patient will follow for a given diagnosis and how treatment can be delivered in the most effective and efficient manner.

CHAPTER 8

ANALYSIS AND FUTURE RESEARCH

Introduction

This chapter is divided into four sections. The first is a summary and synthesis of the interviews conducted. Next, the conceptual model discussed in Chapter 4 will be evaluated, and the propositions will be reviewed. Implications of this research will be explored and, finally, suggested future research examined.

Synthesis of In-depth Interviews

Due to the Union Bank of Switzerland's (UBS) perspective of logistics in service organizations, it served as the conceptual foundation for the research effort. A traditional transportation / logistics firm was also chosen as a point of reference in the logistics arena, and hospitals were chosen given the current logistics research done in the area.

A convenience sample was used to select additional companies for review. The Presidents or Executive Vice Presidents of each organization were contacted by mail requesting an appointment to discuss the research effort. After the initial contact, these individuals provided the researcher

with access to their organization, at times scheduling the appointments with their staff. All of the firms contacted in this manner agreed to participate in the study.

Two managers from different firms also agreed to participate informally in the research–one in contract logistics and the other in health care. Attempts to interview additional managers within the organization at one firm were unsuccessful, and not attempted at another.

A total of forty in-depth personal interviews were held between October 26, 1992 and March 30, 1993. In addition, two days were spent observing the processes of an operating Room, as well as a diagnostic floor. These appear in the following figures as two interviews of front line workers. Twenty interviews were held at the Union Bank of Switzerland, nine with two third-party contract carriers, and thirteen with four regional hospitals. The personal interviews served as the primary method of data collection. Secondary sources, such as annual reports, news articles, trade journals, internal documents, and promotional materials were also used. The researcher also participated in two outside projects in the health care area that added to the depth of this research effort. A breakdown of the interview information can be found in Figure 8–1.

The average personal interview lasted 1.76 hours, with a range from one to four-and-one-half hours. Field notes were written immediately after

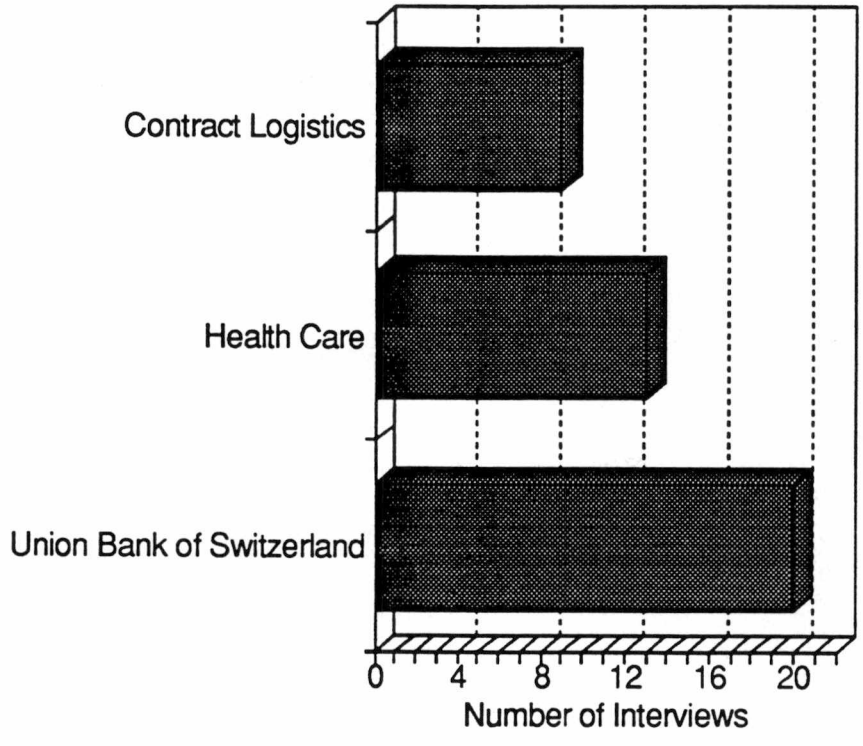


Figure 8–1
Number of Interviews by Industry

the interview when possible, or within twenty four hours. While it was hoped that each of the interviews could be taped, the use of this technology tended to restrict the openness of the executives.

As illustrated in Figure 8–2, sixteen of the interviewees held the title of Vice President, First Vice President, Executive Vice President or President. Ten of the interviewees were Directors or Assistant Vice Presidents, and nine held the title of Manager. The remaining seven interviewees can be classified as front-line workers, or those involved in direct logistics support.

While the number of front-line workers may appear to be fairly small, it does not take into account the number of persons interviewed during the observation of the Operating Room and the Diagnosis Floor. These encounters consisted of an additional seven interviews of front-line workers.

Many of the interviews were arranged by the participating firm. Four initial interviews or contacts led to twenty nine arranged interviews. For instance, UBS scheduled all of the interviews, as did ROLS. In some instances this arrangement could introduce bias into the study, especially if the participating organizations hoped to hide something from the researcher. In this case, however, the participants were extremely open and willing to provide as much detail as possible. The researcher promised, both implicitly and explicitly, to keeping information tangential to this study confidential.

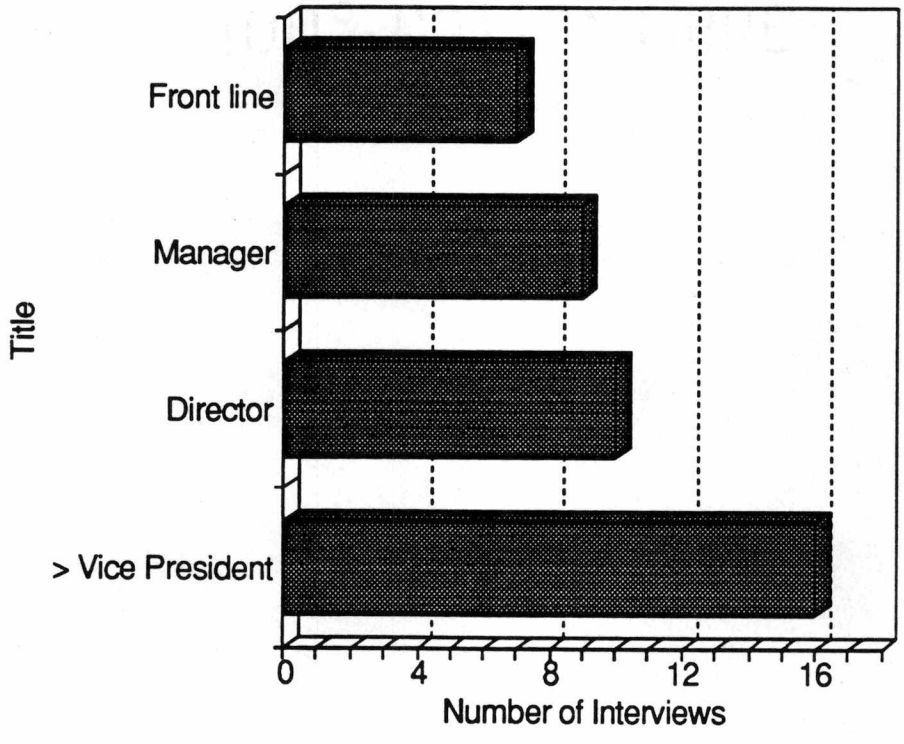


Figure 8–2
Number of Interviews by Informant Title

Conceptual Model Findings and Discussion

This section will discuss the conceptual model as it applies to each of the industries studied. A general model of how organizations can apply the model to reviewing their benefit delivery process will be examined at the end of the section. The general model first proposed is found in Figure 8–3.

Contract Logistics

One of the primary core competencies offered by most contract logistics firms is the ability to coordinate and integrate several service modules, such as truckload (TL), less-than-truckload (LTL) transportation, purchasing or warehousing. Each of these activities can be done by an asset-based contract logistics firm, or by a non-asset-based firm. Asset-based firms are more likely to use their own resources (motor carriers, warehouses) to meet the needs of the customer, while non-asset-based firms do not own the actual service modules.

In this example the role of the customer contact person (CCP), or CCP team, changes over time. The Director of Logistics (DLD) can be thought of as the CCP who makes the initial contact with the client and diagnoses what services the customer needs. In many instances the diagnosis changes as more information is gathered by the DLD. When the customer has agreed to explore the potential offered by the CCP, the CCP puts together a team that will develop a solution for the

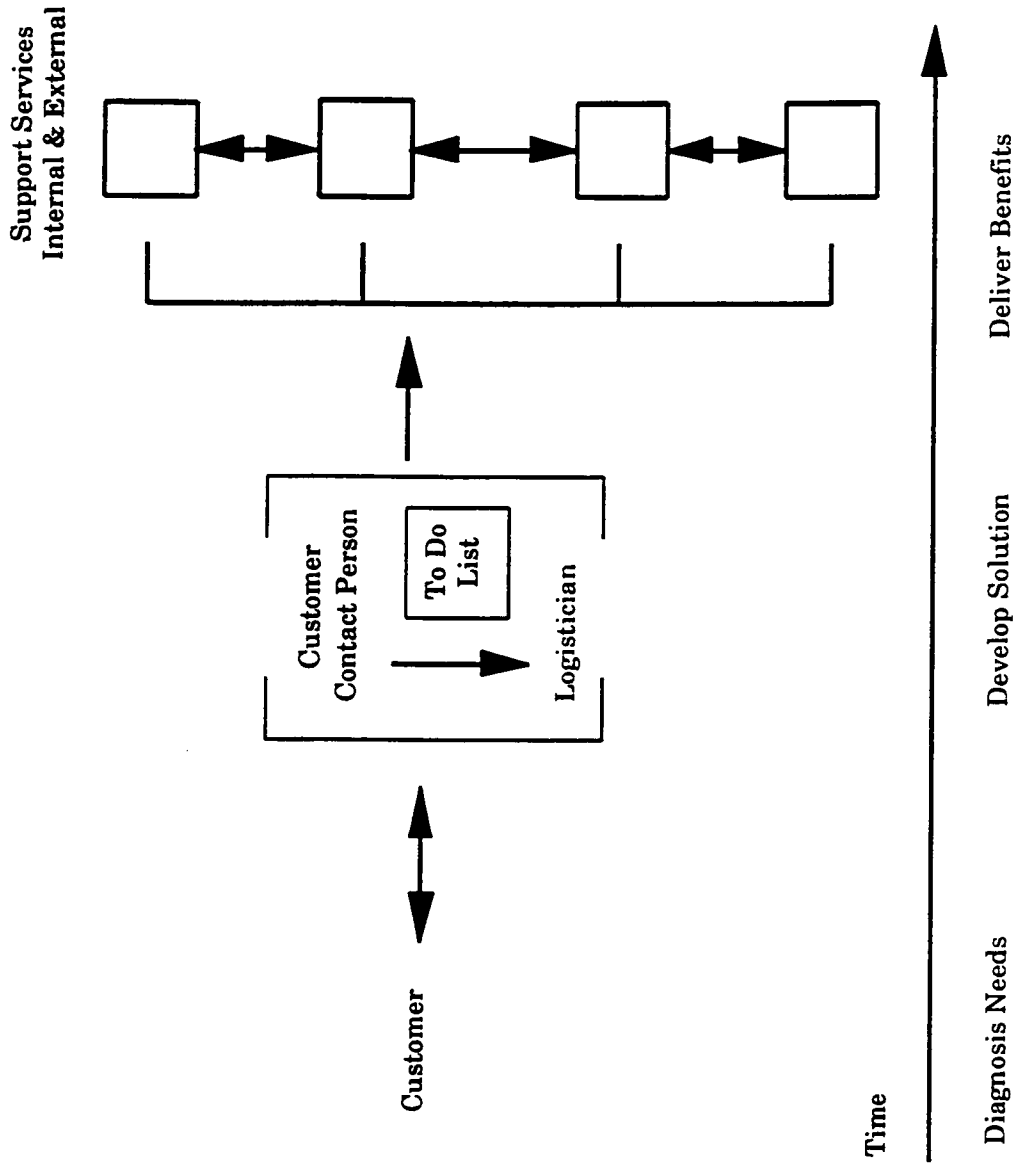


Figure 8 - 3
Final Conceptual Model

client. The logistics analyst serves the function of an RN in health care in that he or she is responsible for delivering a solution that will meet all the needs for the client. The "to-do" list consists of the service elements necessary to deliver the benefit. Determining this list requires additional diagnosis by the analyst, as well as determining which suppliers can best fill these needs.

After the solution has been developed, it is presented to the client by the CCP and possibly the analyst. If it is accepted, Operations assembles the service modules that will serve the client. This may include the hiring of an on-site manager who is responsible for the daily transactions between the contract logistics firm and the client.

While the details of delivering the solution are managed by the operations manager, the CCP manages the overall relationship with the client. Further services that can be provided to the customer are explored, as are opportunities for improvement.

Union Bank of Switzerland

UBS served as the foundation for the conceptual models developed in Chapter 4. It is their understanding and practice of logistics in service organizations that have supported the research into the other industries.

For UBS, logistics is everything that supports the front line. Given this definition, it is not surprising that the organizational structure divides

the firm into front room and back room offices. The front room interacts with the customer and diagnoses their needs. The back office provides direct support (operations) and indirect support (infrastructure) in the benefit delivery process. This process is illustrated in Figure 8–4.

UBS is unique in that it uses a hybrid approach of organizing its tasks. For those tasks that are routinized, the Bank uses the offering-based approach. Typically, these routinized tasks deal with direct logistics support. For those support services requiring a higher level of customization, the Bank uses the responsive approach. This is typically used for indirect logistics support services.

In the case of foreign exchange, logistics provides both direct support of the benefit delivery process by providing the operational expertise necessary, such as settlement clerks, support of outside data systems, and information systems. It also provides indirect support, or an infrastructure, which enables these processes to take place. For instance, this infrastructure consists of buildings, security, office equipment, and PC equipment.

Health Care

One of the most important steps in evaluating the conceptual model is defining the customer. In the health care setting, the customer may be

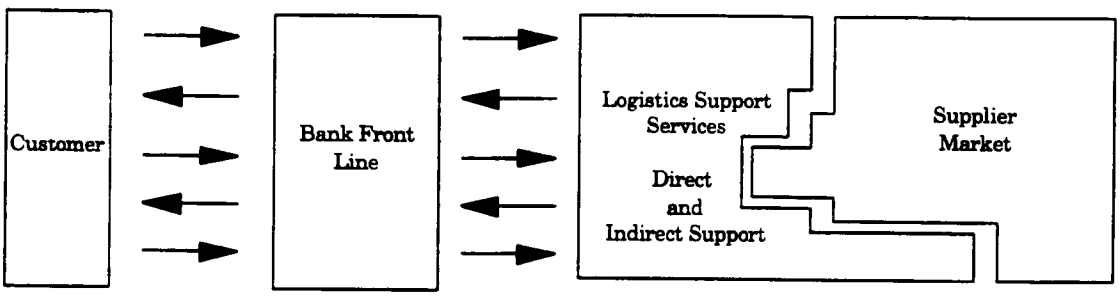


Figure 8–4
Role of Logistics at UBS

the patient, the physician, or a third party financially responsible for the treatment such as an insurance company, HMO, or the patient's employer.

It is at the operational level that the patient is viewed as the customer in the benefit delivery process. The physician acts as the CCP, diagnosing the needs of the patient, and recommending certain treatments to help the patient. The treatment plan is recorded in the patient's chart, Which becomes a "to-do" list for the RN, who ensures that the physician's orders are acted upon.

The treatment plan may be straightforward, or fairly complex, requiring several service elements to be involved in the benefit delivery process. For instance, one patient may require bed rest and medication every four hours, while another treatment plan requires X-rays, physical therapy, and lab work. As the complexity of the delivery increases, the need for a coordinator in the delivery increases. This is illustrated in Figure 8–5.

Traditionally, the RNs have been the logisticians responsible for the delivery of care. When the options available were fairly limited, the patient spent most of his or her time on the same floor being cared for by the RNs. As technological advances were made, and the treatment options available to the patient increased, the patient was no longer relatively stationary, but was required to be moved throughout the hospital. Even though the nurse did not receive additional training on how to fulfill this new responsibility,

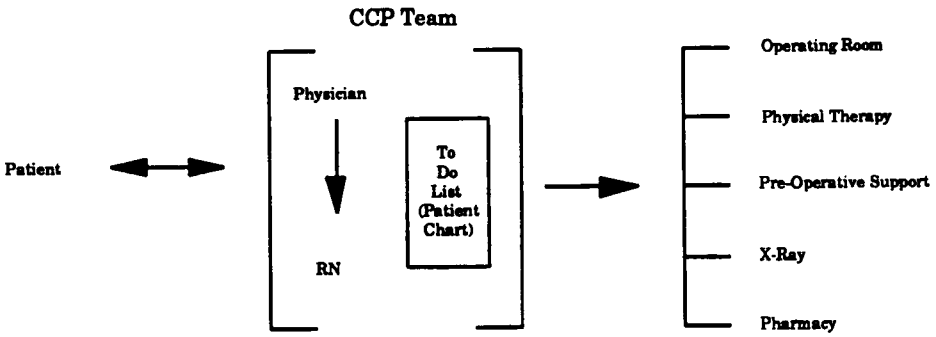


Figure 8–5
Patient as the Customer

it was up to the RN to make certain that the patient made it through this process.

Physicians can also be viewed as customers of a hospital. The hospital provides the physical facility, instruments, equipment, and staff necessary to provide care for its patients. This is illustrated in Figure 8–6.

It is the responsibility of the hospital's administration to diagnosis what the practicing physicians value. This may take the form of value-added services or technologically advanced equipment or instruments. The goal is to determine what infrastructure is necessary for the efficient delivery of care. Administrators need to evaluate not only what equipment or support they are providing the physician, but also how easy is it for the physician to perform in the hospital.

While the model describes the benefit delivery process, its weakness is in the fact that the coordination of care is not well understood or practiced by the health care profession. The process of delivering care is segmented by the functional specialties, leaving few individuals–whether physicians, RNs or administrators–who understand the entire delivery process. The result is poor coordination, longer patient stays, and higher costs.

Some work in health care has begun to look at how the delivery of care is managed. This is typically described as case management, or nursing case management. Unfortunately, this concept is primarily limited

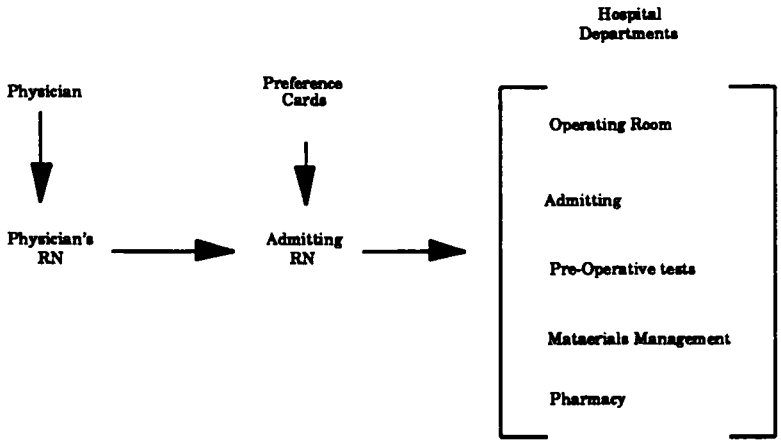


Figure 8–6
Physician as a Customer

to high-cost, high-risk procedures. However, the lessons learned from case management could be applied to other hospital procedures.

For instance, case management attempts to develop a standard protocol or "to-do list," describing each step in a certain diagnostic related group (DRG). A care map, or critical path, is developed, detailing the treatment the patient will receive and when it will be delivered. This standardization allows the RN to focus more time on the individual patient since less time is required to diagnose how the treatment should progress.

Summary of the Conceptual Model

From this discussion it is apparent that the model as considered in Chapter 4 is helpful in describing the logistics process in these three industries. The role that logistics plays in coordinating and integrating responsive activities is critical to the success of contract logistics and allows greater flexibility in wholesale banking. While the hospitals studied did not normatively demonstrate the logistics model, it was evident that its employment would significantly improve the delivery of care.

Two other conclusions can also be drawn from this study. First, logistics should no longer be thought of as a set of functions or activities. Rather, logistics is the management of responsive activities and is responsible for developing and coordinating the infrastructure necessary to

support the benefit delivery process. This view of logistics consists of customers, processes, and resources, as shown in Figure 8–7.

Customers here can be considered as businesses or as individuals. Each has unique preferences, histories, and needs. The logistics organization then develops a process by which it can diagnose the needs of the customer, develop an appropriate solution, and determine the delivery method that will meet the needs of the customer. The solution that is developed may require a wide range of resources. The resources are only limited by what the firm is capable of performing or its capacity to deliver the requested benefit. Resources can be expanded by not merely relying on internal resources, but by developing dynamic networks that enable the organization to quickly respond to customer requests.

This model then focuses on two major activities. First, how is the delivery process is managed and, second, what infrastructure is needed to support the delivery. The first activity occurs primarily between the customer and the process, and the second encompasses the process and resources. Both activities experience a great deal of overlap in the process.

The delivery process refers to those direct and tangible activities that support the delivery of the benefit. In the case of a hip replacement, the direct logistics support would consist of the operating room, nursing staff, physician, and anesthesiologist. Each is critical in a tangible way to the delivery process.

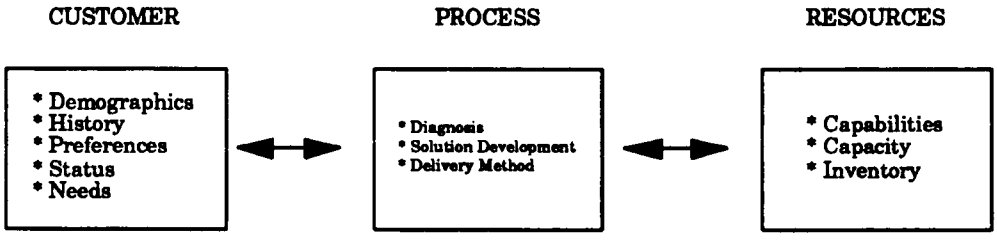


Figure 8–7
Customers, Process and Resources

Infrastructure refers to those intangible or indirect services needed to deliver the benefit. Infrastructure could consist of the hospital's admitting staff, housekeeping, or medical suppliers.

The second model further explores how the physical involvement of the customer, coupled with the complexity of the benefit delivery process impacts the need for an integrated approach. Figure 8–8 places several activities on a quadrant based on these two variables. For instance, the physical involvement and delivery complexity is low when a customer drives up to McDonald's for a Big Mac. The order cycle time is small, and the delivery protocol is well developed and standardized. In the case of a financial planner, a customer needs to provide the initial information concerning what goals he or she has, but the customer does not need to be present as the financial planner goes back to his or her office and develops a solution. The complexity of the solution may be high, especially if the individual is wealthy or has many unique requests.

A personal trainer is an excellent example of the third quadrant, where physical involvement is high, but the complexity of the delivery is low. The trainer can develop a set of workouts for the customer and even provide encouragement as the client works out.

The final quadrant describes those industries where delivery complexity is high, as is physical involvement of the patient or customer.

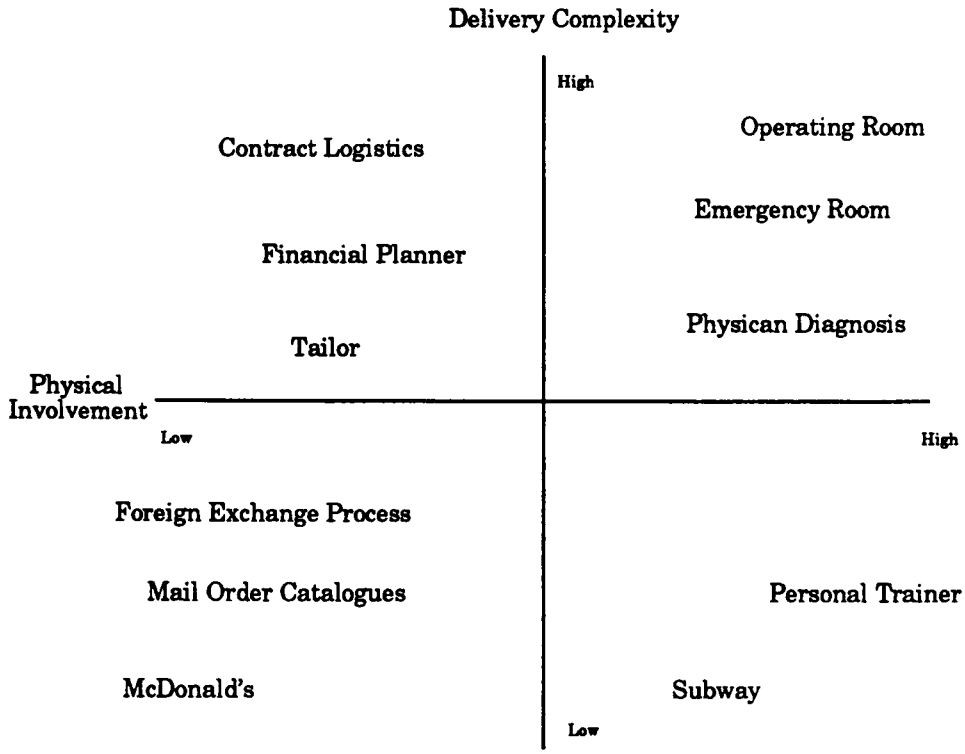


Figure 8–8
Processes by Physical Involvement and Delivery Complexity

Delivering a heart bypass requires the physical involvement or presence of the patient and is complex.

As physical involvement increases, there is a greater need for the company to secure information from the customer and to be provided with a CCP that can interact with the customer to diagnose his or her particular needs. As complexity in the delivery process increases, there is a greater need for protocols to determine how the benefit is to be delivered.

In addition, as physical involvement and complexity increase, the infrastructure of the organization must be more flexible, requiring a greater range of capacity and capabilities. Capabilities must be considered on-line, with immediate access. When physical involvement is lower, the need for immediate access to capabilities can be better managed, and capacity can be more routinely scheduled to account for natural variation in demand. For instance, a physician in quadrant IV must have access to a suture and bandages immediately if a patient has a large cut. The customer is physically present and cannot wait until more suture arrives in the morning. However, the same customer could wait until the morning to learn more about the financial plan proposed by the counsellor since the customer need not be present.

Companies must then determine which quadrant they are currently in, and develop the infrastructure necessary to compete in that arena. It

may be that a competitor is migrating to another quadrant, requiring significant infrastructural changes.

In summary, this section has discussed two additional models that resulted from this research. The first model, presented in Figure 8–7, shows a logistics organization that develops processes enabling them to diagnose customer needs, develop solutions, and deliver these benefits to the customer. Each solution may require a different set of resources that are connected by a dynamic network of internal and external providers.

The second model captures the interaction between the customer's physical involvement in a process and the complexity of the benefit delivery process. The logistics infrastructure that is necessary when a customer's physical involvement is low, the benefit delivery complexity is low, and is extremely different than the quadrant where physical involvement and delivery complexity are both high.

Discussion of Propositions

This section will present and analyze the propositions that guided this exploratory research effort. The findings as they apply to each of the industries will be discussed in turn.

The first Proposition explored the need for organizations to become more flexible and responsive in a dynamic market. Specifically, Propositions 1 and 1a state:

Proposition 1: As firms face a dynamic environment, they must become more responsive to the needs and requests of individual customers to remain competitive.

Proposition 1a: Responsiveness includes such activities as a) customized product design, b) disaggregate information systems to provide individualized responses, c) relationship building in preparation of the need to respond, d) standardization of routine transactions, and e) more personalized attention to special needs.

One of the findings concerning this Proposition is the need to distinguish between coordinators and customers. How logistics responds to each, and especially how support functions respond, is critical to the firms' overall success or failure. For our purposes, coordinators refer to internal entities that receive the benefit delivered by the proceeding work group. Customers refer to external entities separate from the organization. For instance, logistics at UBS has as one coordinating group Foreign Exchange, while the customer could be Citicorp or IBM.

The question then may be asked; What factors are driving the coordinator and CCP to be more responsive? In part, this appears to be the

result of increased sophistication and demands placed on the front line by customers. The customer is expecting and demanding greater flexibility in the benefit delivery process, which in turn places greater demands on the organization's front line (customers of logistics, support services). This then demands greater flexibility and customization in the delivery of logistical service provided to the front line.

This has a significant impact on the logistics delivery process. When the product or service to be delivered to the front line is fairly standard, the role the customer plays in each benefit delivery is minimized. The process can rely on conditional protocols to manage the natural variation in individual preferences. A conditional protocol may have a product shipped by UPS next day with one customer, and by Federal Express overnight with another. Diagnosis of the individual's needs are fairly minimal, given the commodity-like attributes of the product or service. Information concerning the customer, while not immaterial, is not critical. Where the delivery of the benefit is customized by the front line for the customer, and each customer has unique needs and where variation in demand cannot be managed by protocols, the logistics support functions must be more involved with each individual delivery.

An example will help illustrate this difference. At UBS, the benefit delivered to the customer is fairly standard. The needs of the internal coordinator are fairly routine, as are the needs of the individual customer.

While individual customers may have preferences how their transactions will be handled, these preferences are fairly static, and can be managed by the use of "preference cards." A preference card could provide operational information describing where the funds from a currency trade will be withdrawn and deposited. In other words, they provide instructions on how each type of transaction will be handled. The amount of interaction and information flowing between the front-line coordinators and the customer is minimized.

The same occurs in organizations where the benefit delivered to the customer is customized, but not to the same degree. The range of needs of the internal customer is known, but it is not known how each of these service modules will be integrated to provide the benefits necessary to the customer. For this reason it is critical for the support functions (primarily direct logistics support functions, which are described later in this chapter) to be involved with each customer's benefit diagnosis.

In each case the organization must provide the necessary infrastructure necessary to diagnosis the needs of the customer and logistical support to deliver the benefit as requested. The result of combining customer specific data, as in the preference cards, with the company's conditional protocols, is an individualized, specific solution.

As stated in Proposition 1a, these needs can take on various dimensions. Each of these activities will be discussed as they relate to the three industries studied.

Contract logistics firms tend to exhibit most of the activities described above. While a service–transportation–is the core offering, there are several ways in which it can be delivered. A transportation solution may include the use of truckload carriers, less than truckload (LTL) carriers, air freight, rail, or intermodal. The exact mix and use depends on the customer's perceived needs.

This requires that the information supplied to both the front-line customer and the final customer be flexible enough to provide a high level of detail.

Contract logistics firms tend to develop relationships with several transportation and warehouse suppliers prior to having a immediate need for their service. For instance, ROLS has approximately two hundred certified or approved suppliers of transportation and warehouse services. Certification does not determine when or how often a particular supplier will be used, but rather that when there is a request is made, the supplier may bid on the project.

Developing these relationships is even more important for non-asset-based contract logistics firms. The service these organizations are actually offering is the ability to manage the relationships between the customer and

supplier more efficiently and effectively than the customer has done in the past. This requires that the non-asset based firms have multiple suppliers that they view as partners in the delivery process.

Fourth, routine transactions are standardized to enable the front line more time in managing special needs and finding solutions to changing customer requirements. Standardization of transactions can be done by implementing a technologically oriented solution or by developing protocols for managing variances from the standard routine.

At UBS, both coordinators and customers at the operational level are segmented by the offering they purchase. Unlike a retail bank where a single customer may use multiple financial vehicles, at the wholesale level the customer is primarily the user of a single financial instrument. It is at the strategic levels of the firm that the information on each customer must be aggregated and analyzed.

Customization for the internal customer of the benefit delivery takes place at the operational level. That is, customization occurs for each individual department in terms of the reports and direct and indirect logistics support needed. Reports may consist of daily profit and loss statements or total currency trades.

Since there is little to no need to share information across divisions direct logistics support is functionally dedicated to that specific front line

office. Indirect logistics support refers to the physical infrastructure and the technical support necessary to conduct international currency trades.

The findings on how this Proposition applies to the health care arena is less obvious. This is partially due to the multitude of coordinators and customers the hospital must satisfy at the same time. In the past the primary customers were physicians and insurance providers, and the patient was considered the basic customer. As HMOs and alliances become more critical to the delivery of care, the emphasis placed on the individual patient will diminish since hospitals will have to use scarce resources to satisfy these customers.

In many ways, health care today can be compared to the transportation industry prior to deregulation in 1980. Service levels provided by the motor carriers were fairly similar, as were rates. Sales representatives from the trucking firms sold on the force of their personality, and not on the carrier's commitment to performance. Since rates were set by the Interstate Commerce Commission (ICC), and based on average operating costs for all carriers operating in the region, there was little incentive to lower costs and increase efficiency.

With deregulation, this changed. Motor carriers began to compete not on personality, but on cost and their ability to provide better service to their customers. Carriers differentiated themselves with the services they provided, and even began adding services, such as EDI, not considered

years earlier. The role of the transportation provider shifted from being passive and cost-control oriented to a proactive approach focused on delivering value to the customer.[1]

In summary, this Proposition has illustrated that firms respond differently to changes in their environment, much of which seems to be based on their understanding of the importance of coordinating and integrating activities across departments or divisions. At UBS, the ability to better manage the operational aspects of delivering foreign exchange results in lower costs and higher profits. For ROLS and other contract logistics firms, it is their ability to develop dynamic, operational solutions to meet the needs of the customer. This requires the contract logistics firm to manage a network of providers that can respond to the customer's need quickly and efficiently. ROLS allows its customers to focus on their core competencies, and the requests of their customers. In health care, the understanding of how to coordinate the benefit delivery process is still in its infancy.

Proposition 2: As firms become more responsive to the needs of individual customers, the role of support services increases in importance.

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[1]Coyle, John J., Edward J. Bardi and C. John Langley, Jr. *The Management of Business Logistics*, Fifth Edition, (West Publishing: St. Paul), 1992, p. 518-519.

Proposition 2a: In static markets, the goal of support services is to reduce or maintain internal costs.

Proposition 2b: In dynamic markets, the goal of support services is to enhance flexibility so the organization can respond to its customers' changing needs.

On a continuum, there are two basic ways an organization can respond to the needs of individual customers. At one end of the continuum, the organization can offer a single product or response or, at the other end, it can be fully responsive, where each delivery is unique. Where along this continuum a firm decides to compete, whether that decision is made consciously or by default, determines the role of logistical support services in supporting the mission of the organization. Propositions 2a and 2b describe the role of support functions given this continuum.

Since UBS operates as a hybrid of the model described in Chapter 4, both propositions 2a and 2b are simultaneously supported, but at different levels within the organization. Proposition 2a was confirmed for direct logistics support in the foreign exchange process, and Proposition 2b was confirmed concerning indirect logistics support. Each will be discussed in turn.

At the operational level, the goal of direct logistics support is to provide the highest level of service possible at the lowest cost. This has been accomplished by standardizing the delivery process since customer requirements and product attributes are fairly static.[2] Operational costs for foreign exchange have been benchmarked with other providers, and internal costs have been found to be lower than other providers.

In order for indirect logistics functions to effectively and efficiently support the foreign exchange process, the interaction between the front line and the support function is standardized. Standardization of the interface was illustrated in part by the bank's use of liaisons within each department to communicate needs between departments. By standardizing the interface, UBS spends more time working to be responsive to the needs of the front line.

This means that the infrastructure is based on conditional protocols and dynamic dispatch. The conditional protocol, or preference card, instructs the settlement clerks how to manage each of the transactions. The preference card details what bank a customer's funds will be drawn

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[2]While it is true that the financial market as a whole is rather dynamic, from an operational perspective the service is fairly standard. Volume is fairly consistent, as is the product itself. Changes that are required tend to focus on providing the internal customers with more and better information in making trades, than in the actual product itself. This has made room for other companies, such as FXNET, to offer services that will assist their customers in reducing the costs of transferring monies between entities. This was also illustrated by the use of daily P/Ls for each foreign exchange desk.

from, or where deposits will be made. Each trade is dispatched by the currency trader, and completed by the settlement clerk.

At the strategic level, UBS typifies Proposition 2b. This is most evident in the information systems currently be used by the firm. Integration is limited to the strategic level, which in many cases means that the information flows closely match the product lines within the organization. When and if there is a need to update or revise the software for a product line, UBS need only concern itself with the single "hook" that connects it to the systems.

The ability to be flexible is one of the main advantages ROLS offers its clients. Contract logistics firms must develop the ability to diagnose customer's needs on a case-by-case basis and then provide a network that can respond to the customer's special needs.

ROLS can be seen as the support entity, much like logistics is viewed at UBS. The client need not be concerned with managing a group of internal or external transportation and warehouse suppliers (service modules); that is the responsibility of ROLS. This allows the contract logistics firms' client to direct its attention and resources to their own customers.

In health care, the coordination of the service modules has begun to receive greater attention. The coordination of care is referred to as nursing

case management, or simply case management. The quotes below provide some of the more current definitions of case management.

> Case management is a set of logical steps and a process of interaction with service networks that assure a patient of receiving needed services in a supportive, efficient, and cost-effective manner.[3]
>
> Nursing case management involves a comprehensive health care delivery process that coordinates all of the health-related services required by an individual.[4]
>
> Nursing case management mobilizes, monitors, and rationalizes the resources that a patient uses over the course of an illness.[5]

Case management is an attempt on the part of health care providers to achieve the same goals that UBS has accomplished by incorporating a hybrid approach to responding to customers. Instead of treating each new diagnostic related group (DRG) as a completely new process, case management attempts to standardize the treatment by developing a protocol to ensure that patients receive the necessary level of care quickly and efficiently.

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[3]McKenzie, Claudia B., Natalie G. Torkelson and Margaret A. Holt "Care and Cost: Nursing Case Management Improves Both" *Nursing Management*, Vol 20 No. 10, October 1989, pp. 30-34.

[4]Firman, Julie "Case Management: Quality Care Today" *Hospital Materiel Management Quarterly* Vol. 12 No. 3, February 1991, pp. 22-25.

[5]Giuliano, Karen K. and Cathy E. Poirier "Nursing Case Management: Critical Pathways to Desirable Outcomes" *Nursing Management* Vol. 22 No. 3, March 1991, pp. 52-55.

One of the participants in the study, a Case Manager, provided the following example. A group of physicians at her hospital was responsible for a majority of joint replacements. While a hip replacement patient's average length of stay for the group was around ten days, one physician's patients were staying on average sixteen days. Since the hospital is paid a fixed amount on each DRG, it was not possible to recover the added costs of these days. The Case Manager gathered data to determine the reasons this particular physician's patients' length of stay was so long. When the data was shared with the physician, he was surprised and very willing to change his practice to better reflect the group's practice.

Specifically, the data suggested that the physician occasionally forgot to write down in the progress notes what treatment the patient was to receive that day. This simple oversight added a minimum of twenty-four hours to each stay.

To reduce these errors, the physician had the case manager develop a standard set of progress notes detailing what treatment the patient would receive each day of his or her stay. Instead of the physician trying to remember the protocol, the standing orders served as a prompt or reminder of the progress the patient should be making. The physician only had to initial the orders and the treatment would be carried out by the appropriate service module.

The study resulted in the physician achieving the shortest stay for that DRG in the practice at no loss of quality for the patient. In fact, quality could be said to have increased since the patient is now able to go home more quickly. The hospital also reduced its costs on average by six days since the physician was discharging his patients in a more timely fashion.

Overall, is was difficult for many of the participants to define what departments or divisions within their organization constitute support services. One executive at a hospital remarked that in his organization, "We have people who take care of the sick, and people who take care of the people who take care of the sick, and then we have people who take care of the people who take care of the people who take care of the sick." Yet the facility is not structured in this manner. Instead, it consists of a myriad of departments and specialties, much like hospitals in the country today.

This resembles much of what logistics was like in the early 1960's, with its components scattered throughout the organization. This resulted in inefficiency and higher costs. As the importance and awareness of logistics grew, and an understanding of how logistics could increase the competitive advantage of the firm, logistics activities began to become more consolidated within a single department.[6]

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[6]Coyle, et al, ibid., pp. 484-490.

The definition of support services depends on the perspective taken by the researcher. In the case of wholesale banking and health care, the support service mostly consist of internal suppliers or of internal suppliers who facilitate the use of external suppliers. In the case of contract logistics, the entire company like ROLS can be thought of as the support service.

In summary, Propositions 2, 2a and 2b are illustrated in Figure 8–9. At the one end of the continuum are organizations that offer a single response to the needs of the individual customer. These organizations pre-plan and pre-determine the offering and interactions with the customer. Production is scheduled in advance, and deviation from the standard are carefully tracked and monitored. The role of support services is to monitor these activities, and make certain costs are minimized.

At the other end of the continuum are organizations that are fully responsive. These organizations schedule capacity and develop capabilities both in-house and with external suppliers. The role of support services is to maintain a wide range of capabilities that can efficiently meet the needs of customers when they have a request.

As illustrated in Figure 8–9, when products or services are pre-planned and pre-produced, there is little need to manage each individual relationship between the customer and the front line. Little, if any, information in needed from the customer to produce the offering, and no customization of the offering would occur even if requested by the

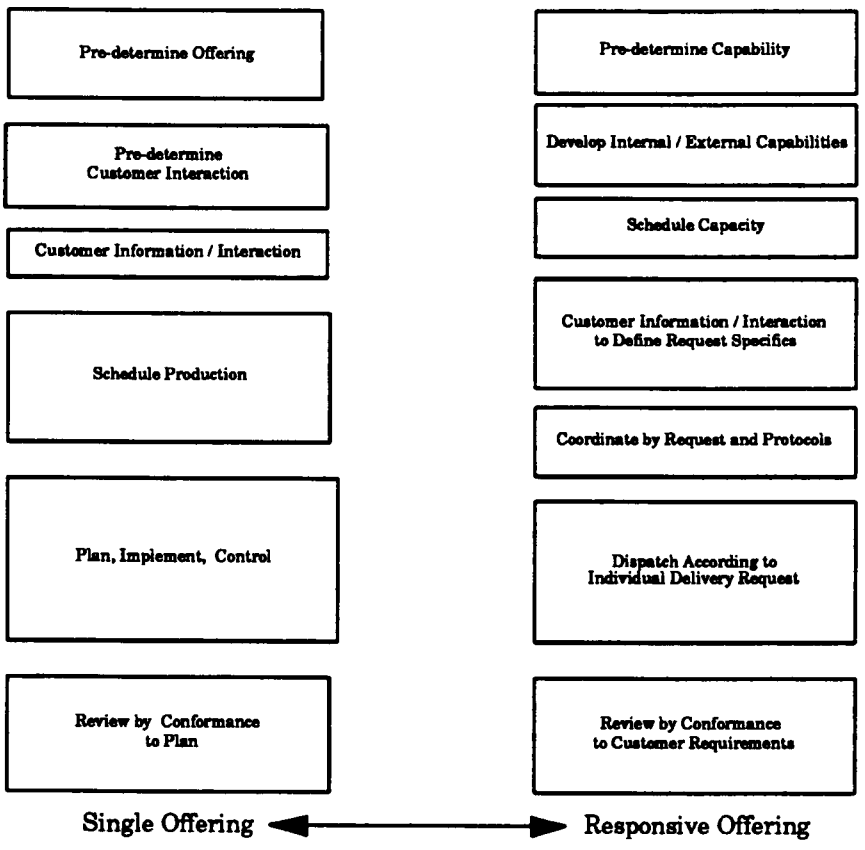


Figure 8–9
Responsiveness Continuum

customer. When multiple customers request a similar change, the market may be segmented by the producer. This enables them to concentrate on internal efficiencies and minimize the contact with their customers.

However, as firms move to serve the needs of each individual customer, additional information and capabilities must be gathered and put in place. Individual customer demand, usage patterns, and preferences must be maintained on a per customer basis.

An example may illustrate differences between these two approaches. Consider a dispatcher at a local taxi cab and a scheduler for a mass transit bus system. On an hour-by-hour basis, how critical is a dispatcher for a taxi cab, in comparison to a scheduler for a city transit system? In the case of the latter, the bus system could function if the scheduler took a day off, was late to work, or stayed home to care for a sick child. In the case of the taxi dispatcher, little could be accomplished until another dispatcher is put in place. The dispatcher diagnoses what the individual customer requires, assesses the firm's ability to meet the customer's needs, and schedules the company's assets when the customer accepts the offering. In the case of the city transit system, the scheduler refers to aggregate data to determine what services to provide, and at what times. The plan is renewed and reviewed each year. The transit system puts forward the offering, which can either be accepted or rejected by the public.

The research focused next on the role of logistics in coordinating these activities. The two propositions are:

Proposition 3: As firms become more responsive, the role of logistics in integrating and coordinating the activities of the support services increases in importance.

Proposition 3a: As firms become more responsive to the needs of individual customers, the role of the customer contact person changes from the management of routine transactions to the management of relationships.

The ability to coordinate and integrate a myriad of activities in an efficient and effective manner is the core competency offered by many contract logistics firms. These activities are not necessarily limited to transportation services, but can include inventory control, parts kitting, bar coding, information management, or even purchasing.

Intuitively, contract logistics firms have understood that the CCP's role will change over the course of the relationship with the customer. In the case of ROLS, the primary CCP is the Director of Logistics Development

(DLD), who makes the initial presentation to the firm. As the relationship with the customer develops, the logistics analyst is brought on board and begins to identify solutions to the customer's problems. When the solution is implemented, an operations manager is located on site, where he or she can interact on a daily basis with the customer.

As the relationship changes from diagnosing the needs of the customer to implementing the solution, the role of the DLD also changes. While the DLD may be very interested in the details of the proposed solution to be developed, as time progresses the DLD's level of involvement with operational details lessens. Instead, the DLD must focus on maintaining the relationship with the customer, and foster open lines of communication. This strategy has served ROLS well: in its first three years it has not lost a single customer.

The desire to better coordinate the delivery of care is the concern of case management. Due to rising costs and reduced reimbursements from the federal and state governments, hospitals must deliver the care more effectively than before. This is accomplished by established or developing protocols for each DRG and providing the necessary support infrastructure to enable the patients to quickly proceed through the care process.

With case management as the exception, little attention is given to the individual or methods used in coordinating the delivery of care by process. A study done by an MBA class at the University of Tennessee

found that no one in a participating hospital could identify a person who knew each of the steps involved in a routine catheterization. Staff members knew their individual part of the process, but not how that part affected the overall treatment or the length of stay of the patients.[7], [8]

These Propositions were also validated at UBS. However, unlike contract logistics or health care, identification of the CCP was more difficult since there the CCP consisted of the logistics division headed by a first vice president. The team of providers operated at different levels of the organization, delivering and monitoring the process for which they were operationally responsible for. It was at the strategic level that major changes in the process were identified and acted upon.

Since foreign exchange product and process are fairly standard, changes are infrequent and expensive. Major changes in the process would not be initiated at the lower levels of the organization, but would require top management support. Time could be devoted to a project reviewing this issue since the operational aspects of the process had been standardized.

This would suggest that the CCP at the operational level would then spend their time managing the relationship with the front-line customer. In part this does happen, but it is most critical at the strategic levels in the

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[7]Anderson, Susan, Cheryl Burks, Kim Davis, Thalia Hooker and Scott Kerber, "A Study of Lead Times and Other Elements Affecting Length of Stay," Team Project, BA 510, Spring, 1993.

[8]This not to condemn the hospital. It is doubtful if an average hospital could provide a flow chart or process diagram of its most common procedure.

organizations. At the strategic levels of the organization, the configuration of the delivery process is modified. In other words, changes in the benefit delivery process and changes in the benefit itself mostly result from discussions that occur at the strategic level.

In summary, this set of propositions suggested that the role of the CCP will change over time as the organization becomes more responsive to the needs of individual customers. This requires the CCP to no longer focus primarily on the operational details of the delivery process, but to better diagnose the needs of the customer. This is accomplished by the provider either by forming a permanent team that will support the customer or by automating the delivery process.

Proposition 4: The relationship between the firm and its suppliers moves from an adversarial role to a partnership as the organization endeavors to become more responsive.

In order to be responsive to individual customers, organizations must have the necessary capacity either in-house or develop capacity with outside providers. Each of the industry exemplified this proposition, but none moreso than ROLS.

During the diagnosis stage, the contract logistics firm must determine what needs the customer wishes to have filled. These capabilities may match internal or corporate capabilities, or it may require capacity from outside vendors. For this reason ROLS has developed a listing of preferred vendors to whom ROLS can request bids on projects. If a customer needs LTL freight movements, ROLS will submit the bid to non-corporate entities.

Sharing this data with a multitude of suppliers requires that there be a great deal of trust between the parties. To achieve the lowest possible cost on each bid, ROLS must inform its suppliers how long the contract is for, the amount of freight to be moved, and the lanes to be used.

Figure 8–10 suggests that organizations may go through three different phases of linking suppliers and customers into their internal processes. At the first level, customers and suppliers are considered as adversaries, with a minimum amount of information flowing between the parties. During the second phase, barriers between customers, companies, and suppliers become less rigid, and more information flows between the groups. An example of this type of relationship would be ROLS and Libby-Owens-Ford. In the final stage, information flows easily from the customer all the way through the supply chain to the various suppliers. An excellent example of this type of integration is the relationship between Wal-Mart and P & G.

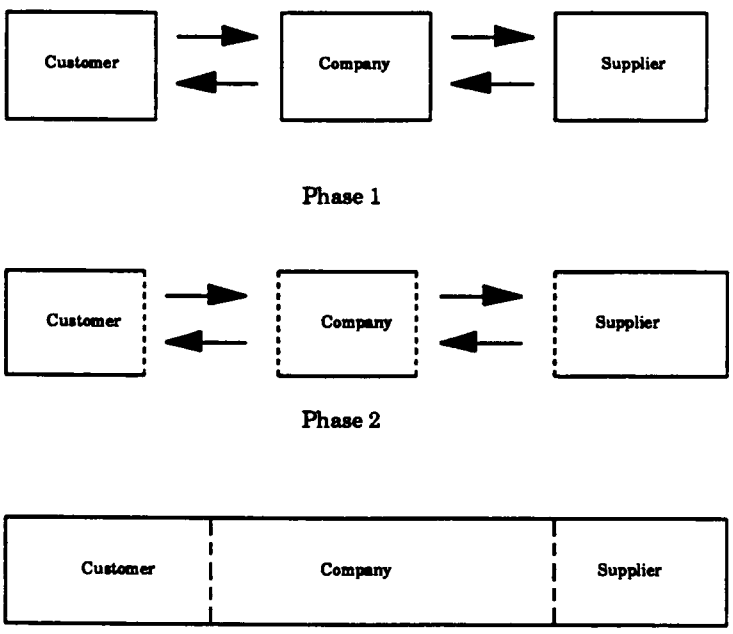


Figure 8–10
Phase Model

Summary

Table 8–1 provides a summary of the findings as detailed in the propositions. The table also highlights many of the differences that contrast the three industries.

The uniqueness of the delivered product, foreign exchange, is low at UBS, but high at a hospital. The benefit has a fairly consistent demand pattern, and scheduling capacity is somewhat routine. In a hospital, demand is highly uncertain, requiring a higher level of capacity be scheduled even though it may be wasted. For contract logistics, while the actual solution is fairly unique, it consists of many common components.

In the case of both UBS and ROLS, the physical involvement in the delivery process is low. This also applies to the diagnosis and development stage, especially when compared to health care. By its very nature, delivery of a health care benefit cannot be done without the patient's presence. For instance, how would a surgeon deliver a triple heart bypass if the patient were out playing golf?

The three industries also varied in how they determined the primary customer for support services. For UBS, it is the front room currency traders; for ROLS, it is an external client. In health care, support services serve both internal customers, such as pharmacy or X-ray, and external customers, such as physicians and patients. In order to effectively and

Table 8–1
Summary of Findings by Industry

	UBS	ROLS	HOSPITALS
Uniqueness of the delivery product	Low	Medium	High
Customer physical involvement in the delivery process	Low	Low	High
Primary customer	Internal Department	External Company	Both
Use of protocols	High	High	High
Standardization of the interface between CCP and the coordinator	High	Medium	Low
Orientation of support services	Process	Customer	Department
Use of outside providers	Low	High	High
Information flows	Product	Customer	Department & Patient
Role of supply chain logistics	Low	Low	Medium
Level in organization where coordination is most important	Strategic, long run, diagnosis	Shifts with time	Delivery
Formal awareness of coordination	High	High	Low
Degree to which support services have restructured	High	Medium	Low
Scope of activities	International	National	Local
Coordination as a core competency	High	High	Low

efficiently do so, all three groups rely on protocols, which determine the interaction between the customer and the organization.

This orientation affects the orientation of the support services. Since the foreign exchange process is fairly standard, UBS focuses on the delivery process. At ROLS, given the variation in customer requirements, the orientation of the support group is towards the individual customer. For health care, this orientation has been towards an aggregate department.

In all of the industries selected for this research effort, the role of supply chain logistics was fairly minimal. Products were tangential in the benefit delivery process. The benefit that foreign exchange or contract logistics provides to the customer is not directly impacted by the presence or absence of a physical product. In health care, the role of materials is more important, but here too the role of the physical goods is supportive in nature. For instance, patients do not go to a hospital to get stitched with suture; rather the suture is used to delivery the primary benefit, which may be closing an incision.

Another major difference between the informants was their awareness of the need for coordination to better fulfill the benefit delivery process. It was explicit in the case of UBS, where there is a high commitment to better meeting the needs of its customers. It was also relatively high at ROLS which, like many other contract logistics companies, has staff on site of its larger customers to manage and

coordinate the delivery process. It was less evident or even initially acknowledged in many of the health care facilities at the operational and tactical levels of the firm. It was understood at the strategic levels of many of the hospitals, with one informant commenting that, "One of the biggest challenges facing health care today is logistics."

Finally, the ability to coordinate the delivery of responsive activities can be seen as a core competency at both UBS and ROLS. It is this ability and benefit that contract logistics firms are offering in the marketplace, and what keeps both competitive.

Implications and Future Research

As with any exploratory research project, the purpose is not to determine which questions can now be answered but, what are the questions that should be asked? This research effort has attempted to understand what questions are important and should be further explored.

This section is divided into two sections. The first section presents a discussion of the implications of this study from a theoretical, methodological perspective. The next section presents future directions and opportunities for research in the area of service response logistics.

Implications

This research has shown the importance of understanding how organizations integrate and coordinate activities to meet the needs of individual customers. As such, it offers three implications for academicians and practitioners.

First, this research expands our understanding of the role of logistics from concentrating solely on physical flows to the coordination of responsive activities. This means that logistics is evident and critical in both product-oriented and service-oriented firms.

This should provide managers a broader view of what logistics is and what their contribution can be. Logistics professions should no longer only consider product-based firms to further their career, but should begin to develop relationships in the service sector. A solid logistician may be as valuable to a hospital as a good marketing manager was to a trucking firm after deregulation.

For academics, the role of logistics could be defined as the management of responsive activities that either directly deliver benefits to the customer or provide the necessary infrastructure required in the benefit delivery process. These benefits may or may not involve the use of a product, and they may rely on either internal or external capacity and capabilities to deliver these benefits.

Second, the study has shown that there is room for significant improvement in the coordination of responsive activities in the health care industry. One of the core competencies offered by contract logistics firms is their ability to coordinate and integrate responsive activities. This ability is based on technological innovations, such as information systems, as well as a thorough understanding of the transportation and logistics field.

This ability to coordinate activities is not limited to products, but transcends the manufacturing–service sector dyad. There is potential for dramatic improvement in the health care sector if attention is focused on how to better coordinate internal activities. These activities are not limited to the physical supply and distribution of materials, but rather the scheduling of capacity, integration of information systems, and coordination in the delivery of care to the individual patient.

While case management provides a starting point in understanding how care is delivered according to conditional protocols, it is limited to include only those direct service modules. It does not begin to take into account how other supporting departments are or will be impacted by the protocol that is developed.

The models would also suggest that the organization of hospitals should more closely align itself with the actual benefit delivery process, and not the traditional functional silos that are currently embedded in the hospital.

Understanding the importance of integrating the delivery of care and implementing protocols that will enable the facility to better manage this process could result in significant cost savings for the industry. According to Robert Delaney, since 1981 logistics costs as a percent of GNP has decreased from fifteen percent to around eleven percent. This savings translates to over $600 billion in savings per year during the 1990's.[9]

Presently, manufacturing accounts for around eighteen percent of GNP,[10] with health care costs above thirteen percent.[11] If the same savings realized in manufacturing due to logistics could be obtained in the health care field, this would result in a savings of over $500 billion per year.

This figure does not take into account the full savings that could be achieved in the entire service sector. With eighty two percent of GNP consisting of everything but manufacturing, even a two percent reduction in costs would result in savings well over a trillion dollars.

Third, the research also provides an opportunity to re-evaluate the role of logistics in the delivery of customer value. Customer value is determined by how well the needs of the individual customer are diagnosed, how well a solution to meet these needs is developed, and how well this solution is delivered to the customer.

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[9]Coyle, et al, ibid., p. 41.

[10]U. S. Bureau of Economic Analysis, "Survey of Current Business" April, 1991.

[11]Fuchs, Victor R. "Health Care Cost Containment: No Pain, No Gain" *Economic Times*, Vol. 4 No. 3, March 1993, pp. 4-5.

Future Research

This section will focus on opportunities for future research and insights that have been gained from this study.

Initially, it may be thought that, due to the purposive sample used in this research, the generalizability of the results are limited to service organizations. However, the models provide a normative purpose in providing logistics managers with a new approach to better understand the needs of their customers and how their internal processes for delivering that value should be developed.

Specifically, the models have direct application to those organizations that are currently restructuring their activities to be more customer focused. These activities include the development of cross-functional teams that are responsible for either a single customer or a small subset of customers.

The goal is to develop a credible model, and the challenge is to look for those events or situations where the proposed model is invalid, or where it requires significant alteration. This means that additional research should focus on confirming or dis-confirming the present model. This can be accomplished by triangulation across researchers, negative case analysis,

regular on-site team interaction and debriefing by peers.[12] These methods should reduce the possibility of bias on the part of the researcher(s).

Second, an understanding of how the process of coordination and integration takes place needs to be better understood. One of the problems with defining this process is that it takes many forms; coordination may occur at the front line.

Third, how is customer value influenced or altered as a customer's physical involvement increases? Are there ways to decrease physical involvement, yet still maintain high levels of customer value and be able to deliver the benefit? Do customers realize higher value if their involvement in the delivery process is lowered?

Future research should explore how customers, be they internal or external, perceive how well the benefit delivery process performs. How can the benefit delivery process be improved? How much interaction or involvement should the customer have in the process? How much interaction or involvement does the customer want to have in the process?

Fourth, how do we define or measure a firm's ability to effectively and efficiently coordinate responsive activities? Is there a single measure or methodology that will capture coordination? Total cycle time measurements lack the ability to determine if the delivery process was both effective and

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[12]Wallendorf, Melanie, and Russell W. Belk "Assessing Trustworthiness in Naturalistic Consumer Research" *Interpretative Consumer Research*, Elizabeth Hirschman editor, (Association for Consumer Research: Provo, UT), 1989, p. 71.

efficient. In part, this is due to the variation found when delivering benefits for individual customers. For instance, a cycle time of three hours on a simple blood test may be satisfactory for someone from Russia, but not for someone from Reno. Efficiency, an internal measure, may be calculated as a ratio of scheduled capacity and total throughput.

Finally, it is suggested that additional research must focus on how organizations can more efficiently respond to the needs of individual customers. The future is headed towards mass customization, and we in logistics should play a leading role in this effort.

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APPENDIX

APPENDIX

Customer Responsive Management Paradigm

In an era where there is increasing demand for quality, customers rely on providers who are responsive[1] to their individual needs. Organizational responsiveness earns customer trust, repeat business and higher profits.

In this evolving era, management must understand the following strategies:

1. How to build relationships and expectations so that customers contact their organization first.
2. How to build responsive organizations that can effectively diagnose customer needs and develop desired solutions.

Since marketing and logistics serve the pivotal role in this responsive relationship with the customer, The University of Tennessee's Department of Marketing, Logistics and Transportation will focus its teaching, research and service on the following principles:

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[1] Responsiveness describes the interactive nature of the customer-provider relationship. The organization must interact with the customer to determine wants, need, concerns, aspirations, fears, desires, hopes, apprehensions, and orientations so that benefits can be effectively delivered. Whatever or however it is done, the organization must anticipate, respond and satisfy individual customer needs.

1. Understanding the basis of the customer-provider relationship.
2. Understanding the diversity of needs among global customers.
3. Understanding quality, value, and satisfaction as perceived by the customer.
4. Understanding the diverse interactive relationships among many suppliers, manufacturers, service providers, channel members and customers.
5. Developing tools, technique and structures which enable organizations to be more responsive to customers.
6. Developing management methods which allow greater customer responsiveness at lower costs.
7. Developing and testing flexible research tools for understanding and evaluating responsiveness.

To effectively teach these principles in the classroom, faculty must work closely with industry in their research efforts. These industry-university partnerships will provide a laboratory for testing the relevance and effectiveness of concepts taught students, who become future employees of the cooperating organizations.

VITA

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Teaching interests include service response logistics, logistics quality, third party logistics, and international transportation. Research interests revolve around the role of information in logistics systems, service response logistics, and logistics quality issues. Recent publications have appeared in such journals as the Transportation Journal, the International Journal of Physical Distribution and Materials Management, and the Journal of Business Logistics. Mr. Manrodt has made several presentations at national meeting, such as the Council of Logistics Management, the Institute for Industrial Engineers, and the Canadian Association of Logistics

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Mr. Manrodt has also been active in several other professional activities. He has served as the Director of Undergraduate Advising, Department of Marketing, Logistics and Transportation, where he was responsible for curriculum and career advising for approximately two hundred Logistics and Transportation majors. He is also serving on the Program Committee for the Dedicated Conference on Advanced Logistics and Communications in Road Freight Transport for the 26th International Symposium on Automotive Technology and Automation, to be held in Aachen, Germany. In 1992 he served as a Track Chairperson for the annual meeting of the Council of Logistics Management.

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