Strategic Reengineering: An Internal Industry Analysis Framework

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Over the past 20 years, industries have expanded their boundaries by diversifying into new product areas, by creatively insourcing and outsourcing activities, and by entering into innovative cooperative agreements with companies from other industries. This expansion has almost blurred traditional industry boundaries by creating an economy of industries that are tightly interlinked.

As an industry's scope expands, activities are developed to coordinate cross-industry interactions. In many cases, an industry's integrative activities are more profitable than its traditional operations because of the critical nature of the functions provided and the power gained by coordinating these activities.

This paper introduces strategic reengineering as a framework for understanding an industry in terms of its processes and value-added chains. This internal macro-process perspective on an industry's operations creates new strategic issues to address how industries and companies will operate as a set of integrated value chains.

In this paper, the strategic reengineering industry framework is applied to major product segments of the air transportation industry: airports, airlines, aircraft, maintenance, and components. A strategic reengineering model is developed that identifies the interrelationships among the product segments. The paper concludes by identifying strategic process issues and discussing innovative strategies to strengthen a company's position in an industry.

Industry Analysis Orientations

Industry analysis typically focuses on a company's external dimensions such as its markets, customers, and competitors. Research on industry structure has investigated the influence of economic structure on competition, the advantages of strategic industry control, and the industry factors that influence profitability (Huff, 1982). Another research stream has examined how external changes such as changing customer needs, new technology, government policy, globalization, and economic cycles affect a company's strategy (Hambrick, 1983). The magnitude of external changes over the past 20 years has led strategic planners to develop analytical tools that use external information to help create proactive strategies. As a result, strategies have tended to minimize the importance of understanding the internal industry structure.

In the 1990s, companies are experiencing major shocks from the effects of information technology on the internal mechanisms of an industry. Information technology is now able to link cross-company functions as well as provide value-chain linkage from raw materials to final customer usage (Upton & McAfee, 1996). This technological integration within an industry has two results. First, industry segments can be further narrowed into individual value chains because of the ability to effectively link value chain activities (Ring & VanDeVen, 1994). Second, new industry segments are emerging with the sole purpose of integrating these specialized value chains to better serve the needs of the end consumer (Benjamin & Wignad, 1995).

The decentralization of an industry into more narrowly defined value chains has led to the emergence of new integrating industry segments. As a result, companies are aggressively competing for position in these segments to improve the efficiencies of individual value chains and, more important, to gain strategic control of the industry's coordination activities (Porter, 1979).

Strategic Reengineering: An Activity-Based Orientation to Industry Analysis

This paper characterizes an internal industry structure in order to develop proactive strategies that will shape the industry's technological and operational evolution. Strategic reengineering is a framework to tangibly describe the interworkings of the complex interactions between industry segments. The strategic reengineering approach groups activities into value chains and provides a method to show how those chains interact to create our traditional industry concepts.

The foundation for this approach comes from business process reengineering's desire to establish self-contained, information-driven, value-creating organizational units based on a systematic grouping of activities. The past decade has seen the exponential growth of business process reengineering projects for all types of purposes in every kind of industry. Unfortunately, the majority of these projects have experienced implementation difficulties because they were conducted one process at a time without developing an overall context. Without a broader industry or value chain context for evaluating a process in terms of its customers, inputs, outputs, information systems, ownership, and accountability, business process reengineering projects have often resulted in turf battles over boundaries, resources, and performance responsibilities (Pritsker, 1995). Strategic reengineering establishes the context for individual processes by combining business process terminology with strategic planning frameworks to describe an industry.

An external view of an industry involves a grouping of companies into a set of subindustries defined by products and markets. An internal industry view understands each of these products in terms of the activities necessary to produce that product. What is needed is a way to reconcile alternative viewpoints to an industry's structure (Bogner & Thomas, 1993). The strategic reengineering model brings together these two perspectives by defining internal process activities and then documenting the relationships between these activities in a broad product and market context.

Strategic reengineering industry modeling involves developing a hierarchical system to capture business processes, the value chains, and the interactions between value chains to produce the end product. This hierarchical system starts with the products and product segments of a broadly defined industry. Each of these segments produces a "class of products" based on the characteristics of products and the industry's typical way of classifying products. The transition from a product orientation to a process orientation occurs when each product class is viewed in terms of its unique value-added chain (Porter, 1980).

A value-added chain defines the process activities needed to produce a class of products. A review of the literature on process management identified financial, information, organization, and end-customer perspectives as critical in establishing the boundaries of a product's value chain. The value chain's financial and information characteristics establish the skeleton of the industry modeling activity, while the customer and organizational characteristics provide the substance of the model.

First, the value chain must have a financial basis that clearly defines a beginning and an end to allow its inputs and outputs to be identified and the value created within the chain to be measured. These definitions build a foundation for activity-based-costing systems and enable a design of an effective cost transferring system to quantify the economic relationships between value chains (Slywotzky, 1996). Second, the value chain's scope should be evaluated in terms of its information generated and the information required to support an industry-wide information network. This information clarity establishes the foundation that enables a data management system to efficiently control information within a macro-processes boundaries and to build an information coordination system for more efficient communications across value chains (Scheer, 1992). Third, the value chain must have a clearly identified customer, typically a downstream value chain that can establish the requirements (cost, schedule, performance, quality) for the value chain's activities. The customer orientation builds a downstream production mentality that translates the desires, needs, and requirements of the end customer through the value-added chain (Halal, et.al, 1993). Fourth, the value chain should be specified in a way that clearly establishes the organizational authority needed to satisfy the process responsibilities (Quinn, 1992).

These four perspectives define the boundaries of individual value chains, which can be used to translate an industry's product orientation

into a process orientation. Table 1 summarizes this product-to-process transition by presenting a hierarchical classification system that defines the levels of the hierarchy. Table 1 also provides an example of the levels of the hierarchy for the air transportation industry.

The next step of strategic industry modeling activity involves understanding the various relationships between the value chains. Value chains are designed to accomplish one of three basic purposes. First, horizontal value chains create tangible value within a product segment. Examples of these are manufacturing of flaps, rudders, fuselage, wings, and landing gear to produce an aircraft. Each product has its own value chain, which when coordinated, result in final assembly of an airplane. The second value chain is vertical, which provides the coordination between horizontal chains. An example of a vertical chain would be airplane design where the design activities associated with the airplane's flaps, wings, and tail are coordinated to produce specified flight characteristics in an aircraft. The third value chain type is integrative, where coordination occurs across industry segments. An example would be avionics, which brings together the controls of the plane (aircraft), the flight of planes (airlines), and evaluation of the plane's performance (maintenance).

The challenge of documenting these three different scopes of value chains comes from the complex interactions between them. Some chains are coupled, meaning the output of one chain serves as an input to another chain. A common chain interrelationship is a linked interaction where one particular activity, such as flap design, supports a horizontal chain (wing manufacturing), a vertical chain (aircraft speed controls), and an integrative chain (landing the aircraft).

Table 1
A Hierarchical Classification System of an Industry's Companies, Products, and Processes

Element	Definition	Example
Activity Hierarchy: Industry	A broadly defined set of companies competing to satisfy the needs of end customers	Air Transportation Industry
Industry Segments	The major grouping of companies and products involved in the industry.	Aircraft
Classes of Products	The products and services necessary to accomplish the industry's mission.	Airplane Wings
Value-Added Chains	The self-contained series of activities required to transform inputs into outputs.	Wing Manufacturing
Macro-Processes	The individual activities performed within a value chain.	Flap Design

Another significant modeling difficulty comes from attempting to incorporate a time element into the relationship between value chains. Modelers want to define activities as either sequential or parallel, but the reality of the air transportation industry is that many activities are performed iteratively, meaning that processes interact with each other throughout their chain of activities.

Figure 1 represents the different types of value chains and chain relationships. In the following section, these relationships will be used to create an activity web capturing the interworkings of a broadly defined industry.

The strategic reengineering industry model captures the boundaries of each individual value chain and the interrelationships between value chains. This model creates an activity web by presenting a broad picture of all of the macroprocesses of an industry. The activity web plots each individual value chain in three dimensions: its scope (horizontal, vertical, or integrative), its

interactions (linked or coupled) and its dynamics (parallel, sequential, or iterative). The activity web is the foundation of the strategic reengineering model as it captures the operational essence of the industry and helps identify the critical value chains.

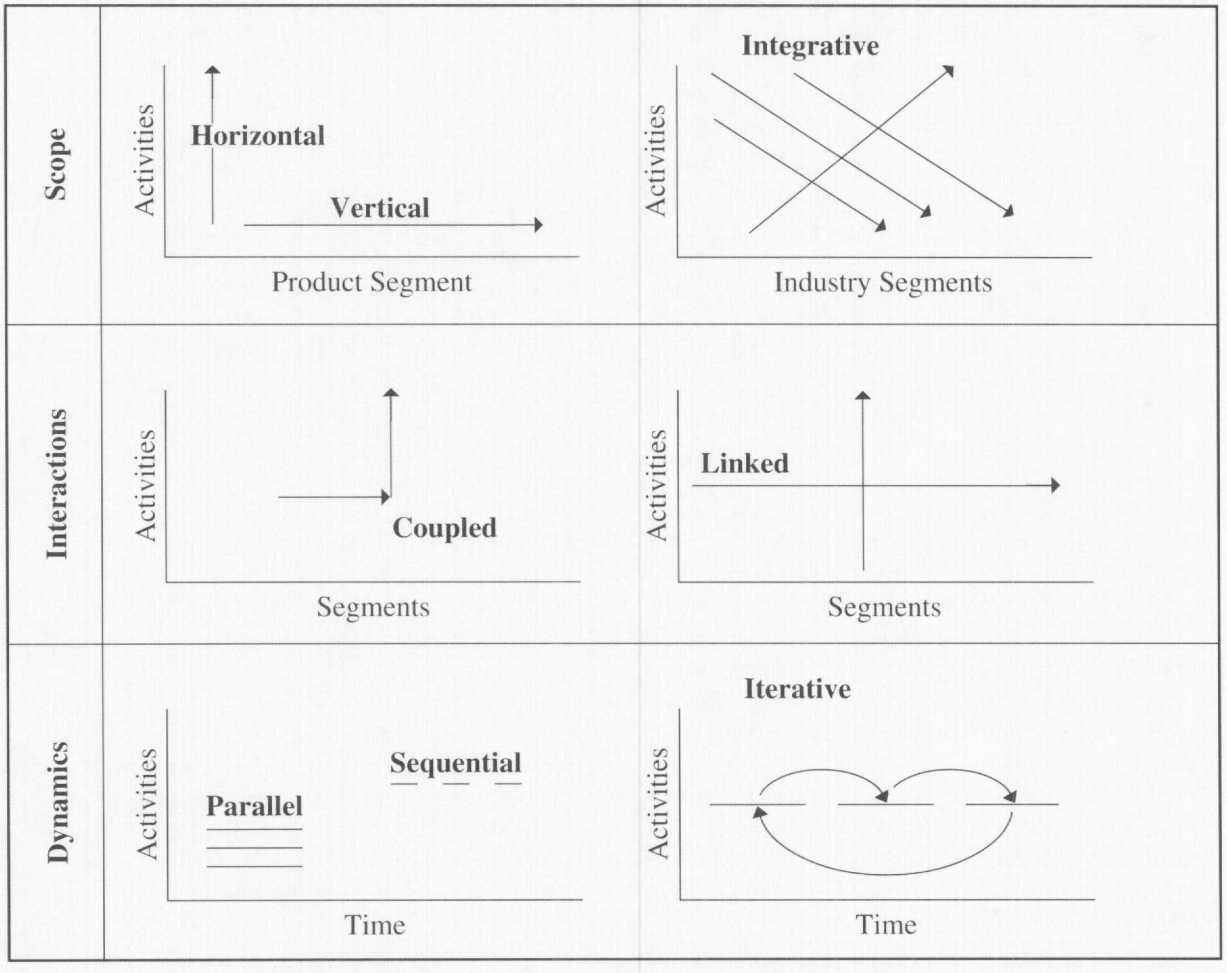
A Case Illustration: The Air Transportation Industry

The air transportation industry is highly fragmented, with complex interrelationships between each of its value chains. The industry fragmentation dates back to an early anti-trust ruling that Boeing's participation in engine manufacturing and airline services was monopolistic. This ruling established the segmentation within the industry and set the tone for potentially confrontational relationships between segments.

With the deregulation of the airline industry in the 1980s, competitive forces reduced industry revenues at a time when coordination costs were soaring. In fact, it has been estimated that the industry as a whole spends 60% of its costs on the transferring and processing of information. The dramatic industry losses in the late 1980s and early 1990s created the need for fundamental structural changes (Dussaugo & Garrette, 1995).

Beginning in the early 1990s, the industry as a whole took the initiative to restructure its basic methods of operation. Individual companies began to improve their internal coordination mechanisms with a combination of information technology advancements, total quality management programs, business process reengineering activities, and activity-based-costing systems. These initiatives in the area of process improvement set the stage for industry-wide strategic reengineering. Given the current

Figure 1
The Types of Value Chains and the Possible Chain Interrelationships



political environment where anti-trust enforcement is minimal and information technology can help facilitate cross-segment coordination, the air transportation industry is beginning a long evolution toward a single integrative industry.

The goal of many executives in the air transportation industry is to set up an operational capability that allows the industry to operate as a series of "continuous" activities. An example of this continuous activity is the petroleum industry, which has traditionally been managed as a series of value-added chains. By structuring activities into exploration, refining, and distribution (i.e., macro-level industry value-added chains), companies have organized their purposes, people, information, and finances to create maximum value at each decentralized process step. The result is a highly flexible, highly efficient industry machine capable of responding to external demands for change. The question is, can the air transportation industry operate as efficiently as the petroleum industry?

The Research Project

A research project was launched to more fully develop the concepts of strategic reengineering and to apply those concepts to the air transportation industry (ATI). This research aimed to build a model of the ATI's value-added chains in order to stimulate innovative strategies and capitalize on the industry's process restructuring. With this goal in mind, the research project had the following objectives:

1. To develop a modeling technique capable of describing the interworkings of a broadly defined industry.
2. To test the feasibility of applying this modeling technique to a rapidly changing industry.
3. To articulate a new set of process oriented company or industry strategic issues.
4. To use the industry model to help formulate innovative strategies for process-based competitive advantage.

The research project was conducted in two phases. First, a descriptive model was created to objectively articulate each individual value-chain and the various interactions between value-added chains. The second phase involved an open forum of air transportation industry company managements to discuss potential applications of the model in order to: (1) evaluate the value-added chains they participated in, (2) forecast new integrative value chains that could fundamentally change the method of intra-industry competition, and (3) set policy on how to compete in the emerging integrated industry.

The air transportation industry has historically focused improvement activities on the horizontal and vertical value chains while accepting the inefficiencies of the current methods used to accomplish the integrative value chains. Industry profitability challenges generated interest in better understanding the cross-segment integrative activities in the industry. In today's industry, the majority of strategic initiatives are concentrating on the effectiveness of this cross-company, cross-segment coordination.

After distributing information about strategic reengineering to companies in the ATI, interest in the concept led to the formulation of an ATI Strategic Reengineering Working Group (Strategic Reengineering Institute, 1996). Forty-three different companies involved in the air transportation industry were invited to participate in the working group. After a series of discussions concerning the goals and objectives of the project, 14 companies decided to formally join the working group. The 14 represented five industry segments: two airports, four component manufacturers, two aircraft assemblers, three airlines, and three airplane maintenance companies. After agreeing to a series of information confidentiality agreements, each of these companies assigned one representative to provide product, process, organizational, and financial data. This working group had the initial mission to bring together diverse vantage points of the industry to construct a comprehensive operational model of the entire ATI.

Twelve of the 14 companies had already prepared a process model of their own internal activities. These individual company process models served as the starting point for the creation of the strategic reengineering industry model. Through a series of iterations over a two-month period, the individual process models were standardized in terms of the use of terminology, definitions, hierarchical classification, and process boundaries. The individual segment models were then reviewed by the various employees at the participating companies. After attempting to resolve disagreements on the boundaries and labels of classes of products and value chains, the working group reached a consensus that the model captured the

general scope and descriptions of activities in the air transportation industry (Air Transportation Association, 1996). Table 2 shows how the five industry segments can be divided into 203 classes of products, and how those classes of products can be expressed in terms of 489 value chains.

The next step of the modeling activity concentrated on specifying the various interrelationships between value chains and individual processes. Figure 2 conceptually depicts the interrelationships between the 489 value chains that make up the industry by providing activity web plots describing each value chain as either a horizontal (serving the particular needs of production within a product scope, e.g., wing design for an aircraft manufacturer) a vertical (coordinating the interaction between chains within a segment, e.g., engine performance assessment that ties together engine design and engine manufacturing), or integrative (activities that cross traditional industry segments, e.g., airworthiness that integrates engine performance, aircraft diagnosis, airline operation, and aircraft maintenance). Because of the complexity of the interactions of the value chains, the time dimension of these value chain interactions was not included in the presentation of the industry activity web.

After circulating the strategic reengineering industry model throughout the 14 participating companies, the response was a combination of intense interest and curiosity about the application of the model to setting company direction. The types of questions asked could be categorized as follows: (1) How do the industry's current practices map onto the model?; (2) If the profitability in the vertical chains is lower than in the horizontal chains, then what strategic leverage is gained from participating in the vertical chains?; and (3) Do the integrative value chains represent several emerging internal industry segments?

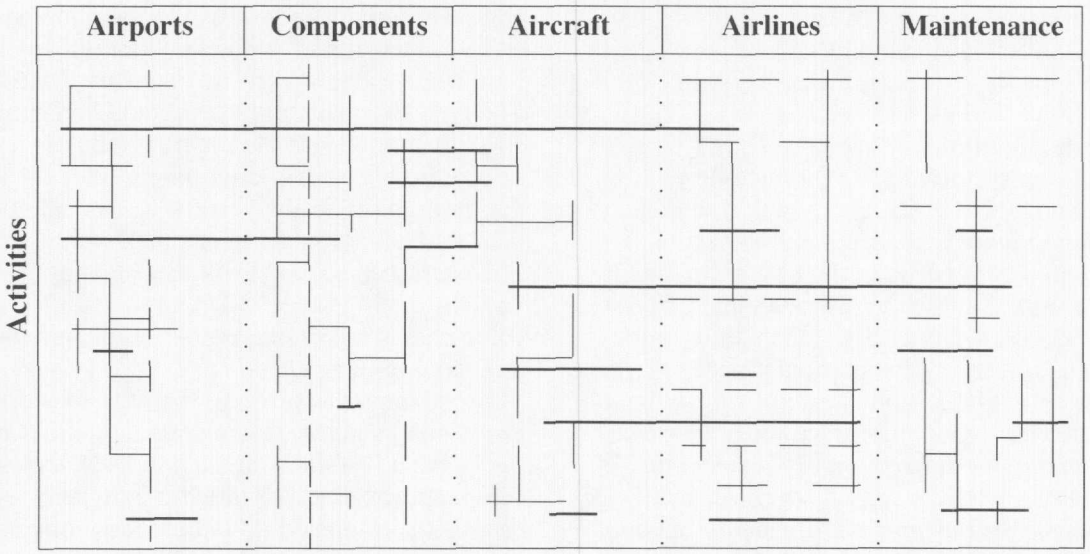
An attempt was made to map the 14 working group companies organizational activities and performance on the strategic model. Each company was assessed to learn how many value chains it participated in within its own industry segment. For example, one airline reported competing in 100% of its segment's chains, while one of the maintenance companies competed in 27% of the possible maintenance chains. The next step was to determine the number of value chains that each company participated in outside its industry segment by relying on internal employee experience. An

Table 2

The Company-Product-Process Hierarchy of the Air Transportation Industry

	The Air Transportation Industry				
Segments	Airports	Components	Aircraft	Airlines	Maintenance
Class of Products	42	63	27	45	26
Examples	• Construction • Equipping • Systems Installation	• Parts • Engines • Avionics	• Wings • Fuselage • Interiors	• Passenger Services • Flight • Freight	• Diagnosis • Delivery Systems • Operation Control
Value Chains	76	121	63	137	92
Examples	• Facility Management • Ground Control • Surveillance	• Logistics Management • Capacity Planning • Manufacturing Operations	• Model Definition • Assembly • Aircraft Support	• Fueling • Routing • Entertainment	• Modifications • Spares Distribution • Field Service

Figure 2
An Activity Web of the Air Transportation Industry



| **Horizontal Value Chains:** Value created by directly providing an incremental output to a particular class of products.
— **Vertical Value Chains:** Value created by providing necessary linkage between horizontal chains to ensure product functionality within an industry segment.
— **Integrative Value Chains:** Value created by coordinating horizontal and vertical chains across industry segments.

example of outside involvement is the way airlines furnish the interiors of new airplanes.

Using internal financial data, an assessment was made of the revenues and costs associated with participation within and across segment activities. Allocating revenues to specific segments was feasible because revenue sources are well documented. Allocating operating costs to specific value chains was difficult, however, without activity-based-costing information, and the resulting values represented best estimates.

The data gathering and reporting mechanism used to summarize information about participation and profitability resulted in questions about the ability to generalize these results and the methodology used. As a result, the working group used this raw data to serve as a forum for discussion within their organizations to attempt to apply the industry model to strategic planning issues.

After distributing the activity web and the performance estimates throughout the participating companies, the majority of comments could be separated into two categories. First, there was tremendous interest in how the specification of the value chain affected current initiatives related to business process reengineering initiatives. There was a consensus that the activity web illustrated the need to view process management holistically. This holistic viewpoint stimulated ideas concerning the purpose of individual processes and also how process improvement projects strengthen the company's system of value chains, which, in turn, together to produce classes of products that meet the needs of the end customer.

The second category of comments related to top management's interest in the activity web and in the grouping of vertical value chains across industry segments. Almost universally, managers could map their own observations, initiatives, and frustrations by relating how the current industry mechanisms performed these integrative functions. The evolution of how the industry performs these integrative activities provided the most insightful comments from a strategic perspective. These comments were analyzed in detail and categorized in the following paragraphs according to how the strategic reengineering industry model could be used to help set company and industry direction.

1. The Increasing Visibility of Integrative Chain Activities

"The strategic reengineering model put into perspective how rapidly our company has expanded the scope of activities within our industry. In fact, viewing the industry model made me realize this phenomena is occurring throughout our industry."

– Director of planning of a major airline

Many of the comments expressed satisfaction with their segment's efficiency and a general level of frustration with the inefficiencies of interacting with the other segments. The labeling and graphic representation of the integrative value chains heightened awareness of a company's activities to improve the efficiency of its traditional coordination mechanisms. Individual company efforts toward this goal fell into one of three categories: (a) creating specialized coordinating organizations, (b) developing cooperative contractual agreements with adjacent value chains, or (c) installing shared information transferring systems to directly link activities.

2. The Cost of Involvement in Integrative Chain Activities

"We probably spend 30% of all of our costs on attempting to coordinate activities with other industry segments. While these activities generate no tangible revenues, our strategic position is dependent upon these activities."

– General manager of an aircraft assembler

Almost universally, when company executives estimated the costs associated with performing the integrative chain activities, they tended to accept them as costs of doing business. In fact, many comments were made that companies in general were spending too little on trying to gain a significant competitive advantage by improving the effectiveness of this segment integration.

3. The Evolution of a Complementary Process-Oriented Industry Structure of Integrative Chain Activities

"I envision the creation of several new segments in this industry to coordinate all of the cross segment chains. Given the industry's current costs and revenues, these new coordinating segments will probably be the most influential and profitable segments in the industry.'

– Manager of new product development for a narrowly focused maintenance company

The strategic reengineering model identifies four major groupings of integrative chains: air traffic management, air worthiness planning and control, avionics flight systems and aircraft support services. These four integrative chains are being developed or enhanced on a daily basis to help perform the inter-segment coordination the industry requires.

Given the costs associated with this so called "red space" (the costly areas of the industry that seemingly create no revenues but absorb tremendous resources), companies are very willing to take aggressive steps toward improving the effectiveness of their cross-segment interactions. With the advances in information technology, communications, and data management, the industry is currently overloaded with innovative applications that fundamentally change the way it does business. For example, advances in the area of flight tracking, aircraft documentation, and airspace scheduling are going to redefine the cross-segment roles and responsibilities of every company in the industry.

4. The Competitive Battleground Over the Ownership of Integrative Chains

"The industry as a whole wants and needs to see the development of these integrating chains. Our company would be more than willing to relinquish control of many of our current activities if it could obtain ownership of other coordinating activities critical to the protection of the company's core business."

– Corporate vice president of a major engine manufacturer

Today's air transportation industry is already seeing a new competitive battleground emerge over these integrative chains. Currently, there are significant obstacles to overcome in the evolution of these new industry segments, especially the ownership of information, the assignment of revenues and costs to the traditional horizontal value chains, and retention of control over key aspects of a company's sphere of industry influence.

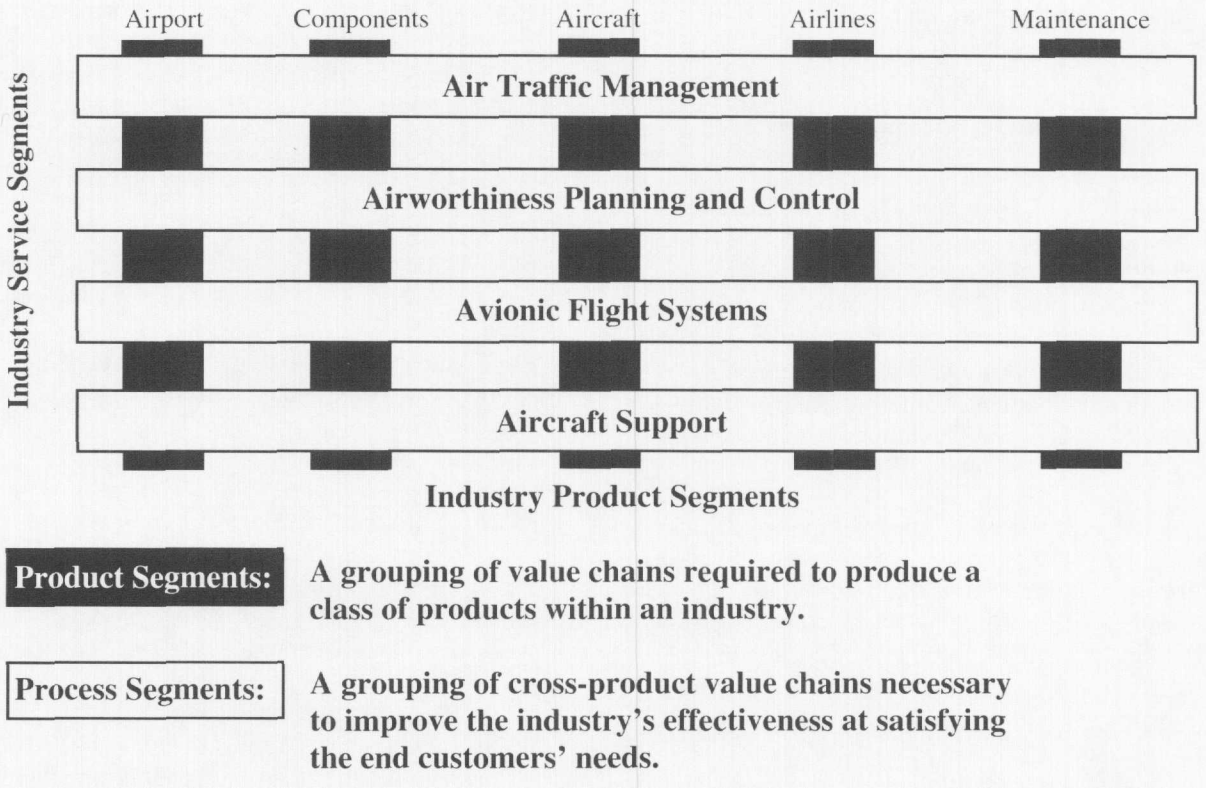
Conclusion: Strategic Reengineering As a Planning Framework

The air transportation industry is an example of a diverse but tightly integrated operation that is experiencing the gradual evolution of new process-oriented segments. Figure 3 shows the industry as an interactive product-process matrix structure. This structure reflects advances in information technology that solidify the roles and responsibilities of integrative functions across the industry's product segments. Figure 3 shows how these four new integrative segments of air-traffic management, airworthiness planning and control, avionic flight systems, and aircraft support services support the product segments.

The fight for control of these emerging integration segments is extremely intense as companies view their revenue sources, profitability, strategic advantage, and distinctive competence as threatened. As these integrative segments emerge, companies must plan to gain control or influence the development of those segments that influence their core business, and to modify their current operations to effectively adapt to the new industry standards and requirements.

Given the magnitude of these structural industry changes, companies are beginning to ask a new set of questions about their strategies. With an emerging cross-segment process orientation, new corporate, business, and functional level strategy issues will be raised (Porter, 1996; Varadarajan & Clark, 1994). These issues will supplement the traditional product or customer industry focus with a new set of strategic process issues. Table 3 presents an overview of the traditional strategic issues for the three levels of strategy and outlines several new process-oriented issues.

Figure 3
The Product-Process Matrix Industry Structure for the Air Transportation Industry



• **Corporate Level Strategy:** Strategic reengineering's ability to view industry activities as a set of interrelated processes can be used to operationalize Porter's work on the five forces of competition (Porter, 1980) from a value chain perspective. The strategic reengineering industry model offers strategic planners the opportunity to construct these five forces for competitive advantage by attempting

Table 3
Strategic Process Issues to Supplement Traditional Product/Market Issues

Strategy	Traditional Product/Market Issues	Supplemental Process Issues
Corporate Level	• Product Portfolio • Corporate Partnership • Internal Investments	• Process Portfolio • Strategic Alliances • Sphere of Influence
Business Level	• Product Positioning • Distinctive Competency • Competitive Advantage	• Product Customization • System Design • System Flexibility
Function Level	• Functional Excellence • Functional Integration • Budgetary Implementation	• Process Effectiveness • Process Decentralization • Balanced Scoreboard

to control key groups of value chains.

The creation of these new segments will change the dynamic relationships within an industry in terms of the functions of companies and the particular companies performing those functions. Just as outsourcing had changed industry participation of companies, the evolution of the process segments will invite companies who have developed highly specialized and highly transferable expertise in other industries. (Doz, 1996). In fact, many experts have predicted that a company from outside the current air transportation industry will be needed to solidify development of the integration chains because of the skills needed and the objectivity required to coordinate existing companies with conflicting financial interests.

Strategic reengineering establishes a new set of policy alternatives to gain control of the strategic portions of the industry's activity web. As industries' integrative functions develop, corporate level strategy will be involved with the following:

1. *Process Portfolios*: Which vertical and integrative chains should we attempt to gain control over (and for what reason), and which vertical and integrative chains should we encourage others to develop?
2. *Strategic Alliances*: What types of cross-segment agreements would benefit both parties?
3. *Sphere of Influence*: How can we gain control of other processes to increase the value of our core process's output, especially through the control of information vital to downstream value chains?

Business Level Strategy: In an industry undergoing a strategic reengineering restructuring, business level strategies need to address the design of value chains that can accomplish product customization with a manageable and flexible process system capable of responding to external shocks.

Strategically reengineered processes decentralized the business strategy questions of positioning (Porter, 1980), patterns of behaviors (Miles & Snow, 1978) and strategic groups (Thomas & Venkatraman, 1988) to individual managed business units structured around a specific value chain.

To integrate the strategies of each of the company's value chain organizational units, business level strategy must establish policies to direct these decentralized value chains. Specifically, a strategically reengineered company needs to view business level issues in terms of these factors:

1. *Product Customization*: How can the company optimize the design and operation of the value chains to obtain process flexibility to customize product requests?
2. *System Design*: How do we integrate the series of value chains to balance the need for efficiency within each decentralized process organization while achieving an effective overall production system?
3. *System Flexibility*: How do we maintain a

highly efficient process structure while building in capabilities sufficiently flexible to respond to external demands for change?

• **Functional Level Strategy:** Most companies rely on a functional organization to execute strategic decisions. The process management philosophy asks the question, "How can the Engineering Department design a product without the intimate involvement of the Sales, Manufacturing, and Distribution Departments?" The answer has traditionally been to create a product-function matrix organization, a structure almost universally applied in the air transportation industry. These matrix organizations decentralize the functional organization bureaucracy but do little to eliminate the basic functional coordination problems.

Strategic reengineering establishes a systematic set of decentralized process organizations at the intersection of the product-function matrix. All of the coordination lines of the matrix organization are now performed by specialized integrating functions (e.g., the vertical chains) or by centralized management functions.

This new organizational approach creates a series of new internal management questions, specifically:

1. *Process Effectiveness*: How can we design, manage, and control a series of process-oriented organizations to create production flexibility, economies of scope, and process standardization?
2. *Process Decentralization*: How can we empower individual process managers to develop methods to satisfy internal customers while meeting the minimal, yet absolute, corporate requirements?
3. *Balanced Scorecard*: How can we plan and control each of these process units with a centralized management made up of human resources, information systems, customer relations, and financial evaluations?

Ideas for Future Research

The concept of strategic reengineering integrates the techniques of process management with the principals of strategic planning. This paper, which represents an initial exploration of how strategic reengineering can be applied in a dynamic industry setting, has stimulated many ideas regarding potential advancement and applications of strategic reengineering.

One area of potential improvement is in the operationalization of processes, value chains, and value chain linkages. Currently, new management systems such as value migration, process ownership, distributive computing, and internal markets need an integrating value chain framework to bring them together into a whole. The improved clarity of value chain boundaries and interrelationships is a critical step in building a foundation for these new process management systems.

Another area for further research is longitudinal study of the evolution of an industry's structure. The advancements in information technology have changed the basic foundation of many industries. These changes have made obsolete many previously critical functions while creating a new set of coordinating management functions. Strategic reengineering provides a framework to track the actual movements of an industry in terms of how it performs its processes and where economic value and financial results are created.

Strategic reengineering establishes a new set of issues for companies to contemplate when developing company direction. Each of these stimulates thought about the various strategies for gaining competitive advantage. Additional work is needed to develop a list of strategic alternatives for each of these issues and to test the performance results of the alternatives as industries undertake the evolutionary process change.

Strategic Reengineering Institute Overview

The Strategic Reengineering Institute (SRI) was founded to integrate business process reengineering concepts with traditional strategic planning systems in order to develop company-wide application of process management tools and techniques.

SRI performs a leadership function to integrate industry practice, consulting methods, software products, and academic theories. This leadership function will help strategic reengineering overcome some of the pitfalls experienced by "business process reengineering" research and applications.

The Strategic Reengineering Institute conducts activities in four major areas:

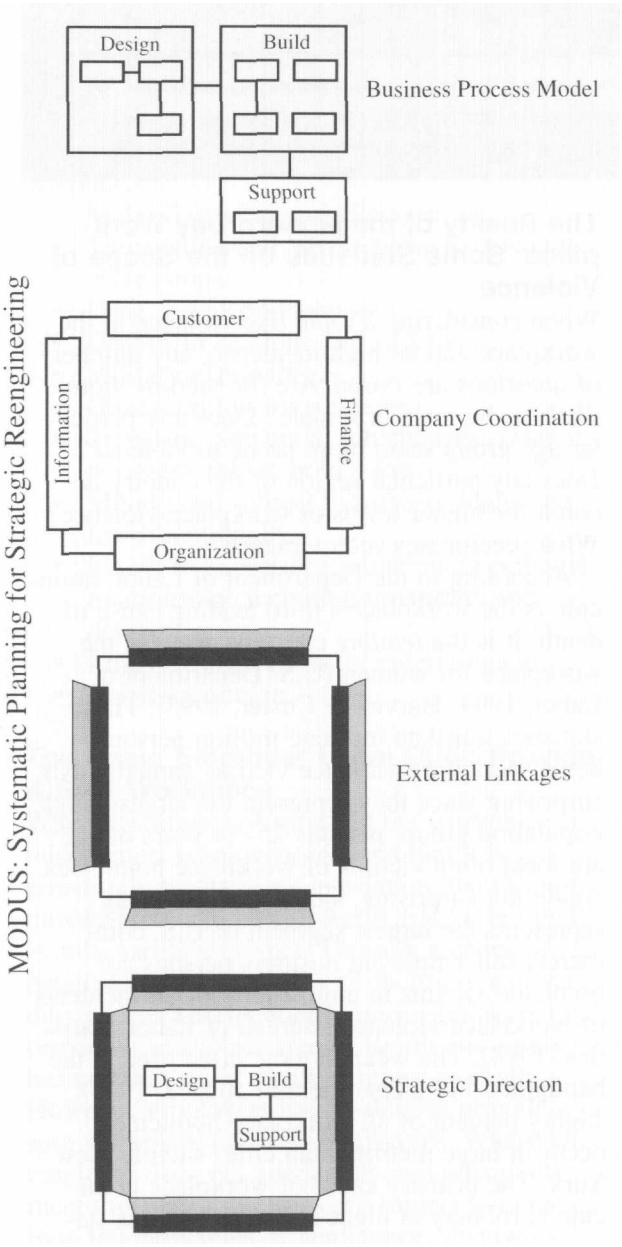
(1) Research and communication: Designs, conducts, and disseminates research concerning the conceptual nature of strategic reengineering, the management

techniques and the examples of strategic reengineering applications.

(2) Product development: Creates and promotes products to systematically assist in the design and implementation of strategic reengineering.

(3) Industry-wide projects; Coordinates industry working groups to investigate company- and industry-wide applications of strategic reengineering.

(4) Educational programs: Develops short courses and seminars to explain strategic reengineering methods and guide strategic reengineering project management.



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REFERENCES

Air Transportation Association (1996, Winter). Industry activity hierarchy diagram. *ATA Industry Specification 2100*, 37–52.

Benjamin, R. & Wigand, R., (1995 Winter). Electronic markets and virtual value chains on the information superhighway. *Sloan Management Review*, 67–72.

Bogner, W. & Thomas, H. (1993). The role of competitive groups in strategy formulation: A dynamic integration of two competing models. *Journal of Management Studies*, 30(1), 51–67.

Doz, Y. L. (1996). The evolution of cooperation in strategic alliances: Initial conditions on learning processes. *Strategic Management Journal*, 17(2), 55–83.

Dussauge, P. & Garrette, B. (1995). Determinants of success in international strategic alliances: Evidence from the global airspace industry. *Journal of International Business Studies*, 26(4), 505–531.

Halal, W., Geranmayeh, A. & Pourdehnad, J. (1993). Internal markets. John Wiley & Sons, Inc., New York, NY.

Hambrick, D. (1983). An empirical typology of mature industrial-product environments. *Academy of Management Journal*, 26 (2), 213–230.

Huff, A. (1982). Industry influences on strategy formulation. *Strategic Management Journal*, 3 (2), 119–130.

Miles, R. E. & Snow, C. C. (1978). *Organizational structure and process*. McGraw Hill, New York, N.Y.

Porter, M. E. (1979). The structure within industries and companies' performance. *Review of Economics and Statistics*, 61, 214–229.

Porter, M. E. (1980). *Competitive strategy: Techniques for analyzing industries and competitors*. The Free Press, New York, N.Y.

Porter, M. (1996 Nov.-Dec.). What is strategy? *Harvard Business Review*, 61.

Pritsker, K. (1995). Top ten reasons for reengineering failure. *Strategic Reengineering Institute Working Paper Series*. Pittsburgh, PA.

Quinn, J. B. (1992). *Intelligent enterprise*. Free Press, New York, N.Y.

Ring, D. M. & Van DeVen, A. H. (1994). Developing processes of cooperative interorganizational relationship. *Academy of Management Review*, 19, 90–115.

Scheer, A. W. (1992). *Architecture of integrated information systems*. Springer-Verlag. New York, N.Y.

Strategic Reengineering Institute (1996, March). Strategic reengineering: Using business process reengineering concepts to redefine industry boundaries. *Confidential Report Prepared for the ATI Strategic Reengineering Working Group*, 1–52.

Slywotzky, A. J. (1996). *Value migration*. Corporate Decisions, Inc., Boston, MA.

Thomas H. & Venkatraman, N. (1988). Research on strategic groups: Progress and prognosis. *Journal of Management Studies*, 25, 537–555.

Upton, D. & McAfee, A. (1996, July-August). The real virtual factory. *Harvard Business Review*, 123–133.