

Causes of Failure in Network Organizations

Raymond E. Miles Charles C. Snow

It is widely recognized that we are in the midst of an organizational revolution. Throughout the 1980s, organizations around the world responded to an increasingly competitive global business environment by moving away from centrally coordinated, multi-level hierarchies and toward a variety of

more flexible structures that closely resembled networks rather than traditional pyramids. These networks—clusters of firms or specialist units coordinated by market mechanisms instead of chains of commands—are viewed by both their members and management scholars as better suited than other forms to many of today's demanding environments.¹

However, despite the current success of network organizations, the most likely forecast is that their effectiveness will decline rather than improve over time. In fact, there is already evidence of deterioration in some network organizations—failures caused not by the inappropriateness of the network form but because of managerial mistakes in designing or operating it.

Indeed, the evolution of the network form of organization appears to be following a familiar pattern. Historically, new organizational forms arise to correct the principal deficiencies of the form(s) currently in use. As environmental changes accumulate, existing organizational forms become less and less capable of meeting the demands placed on them. Managers begin to experiment with new approaches and eventually arrive at a more effective way of arranging and coordinating resources. The managers who pioneer the new organizational form understand its logic and are well aware of its particular strengths and weaknesses. However, as the use of the new form increases, so too does the potential for its misuse. When design and operating flaws multiply, the form loses its vitality and begins to fail.

The Evolution of the Network Form

Over the course of American business history, four broad forms of organization have emerged. First, the *functional organization* appeared in the late nineteenth century and flourished in the early part of the twentieth. This new organizational form allowed many firms to achieve the necessary size and efficiency to provide products and services to a growing domestic market. An early vertically integrated functional organization was designed by Andrew Carnegie who applied ideas about functional specialization from the railroads to steel production. By controlling both raw materials supplies and distribution, he was able to keep his mills running efficiently on a tightly planned schedule. A current example of the functional organization is Wal-Mart, Inc., one of the nation's largest retailers. Across the country, Wal-Mart focuses on a well-defined and socio-economically homogeneous target market as it locates its stores in small towns and suburbs of medium-sized cities. For these highly similar markets, Wal-Mart makes maximum use of on-line computerized sales data from over 1,200 stores to feed what is recognized as one of the most efficient inventory and distribution systems in the country. Like its functional predecessors, Wal-Mart performs a limited set of functions extremely well, using the specialized talents of planners, logistics specialists, and store personnel. However, while Wal-Mart is tightly integrated from its warehouses through its store shelves, the company does not attempt to actually produce the goods it sells. Nevertheless, because of its buying power, Wal-Mart can centrally coordinate an army of suppliers eager to respond to its forecasts and schedules.

Next, the *divisionalized organization* appeared shortly after the end of World War I and spread rapidly in the late 1940s and into the 1950s. Among the earliest divisionalized structures was that designed by Alfred Sloan at General Motors, where specific automobile brands and models were aimed at distinct markets differentiated primarily by price. Product divisions (Chevrolet, Pontiac, Cadillac, etc.) operated as nearly autonomous companies, producing and marketing products to their respective targeted customers while corporate management served as an investment banker for growth and redirection. A modern divisionalized firm is Rubbermaid, whose ten operating divisions account for over 200 new products a year. Each division has its own target market and its own R&D team focused exclusively on that market, allowing maximum responsiveness in a diversified product arena.²

The third organizational form was the *matrix*, which evolved in the 1960s and the 1970s, and combined elements of both the functional and divisional forms. An early matrix structure was created at TRW, which sought to make both efficient use of specialized engineers and scientists while adapting to a wide range of new product and project demands. Technical and professional personnel moved back and forth from functional departments

to product or project teams, and from one team to another, as their skills were needed. Many modern matrix organizations are even more complex, such as the one used by Matsushita, which combines global product divisions with geographically based marketing groups.

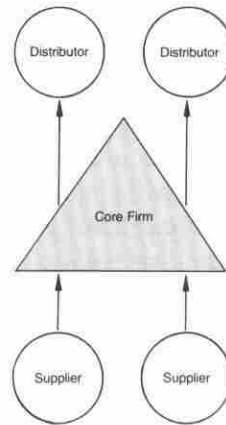
Movement toward the *network* form became apparent in the 1980s, when international competition and rapid technological change forced massive restructuring across U.S. industries and companies. Established firms downsized to their core competence, de-layering management hierarchies and outsourcing a wide range of activities. New firms eschewed growth through vertical integration and instead sought alliances with independent suppliers and/or distributors.

Within this general trend toward disaggregation and looser coupling, managers experimented with various organizational arrangements. Instead of using plans, schedules, and transfer prices to coordinate internal units, they turned to contracts and other exchange agreements to link together external components into various types of network structures.³ As illustrated in Figure 1, some networks brought suppliers, producers, and distributors together in long-term stable relationships. Other networks were much more dynamic, with components along the value chain coupled contractually for perhaps a single project or product and then decoupled to be part of a new value chain for the next business venture. Finally, inside some large firms, internal networks appeared as managers sought to achieve market benefits by having divisions buy and sell outside the firm as well as within.⁴

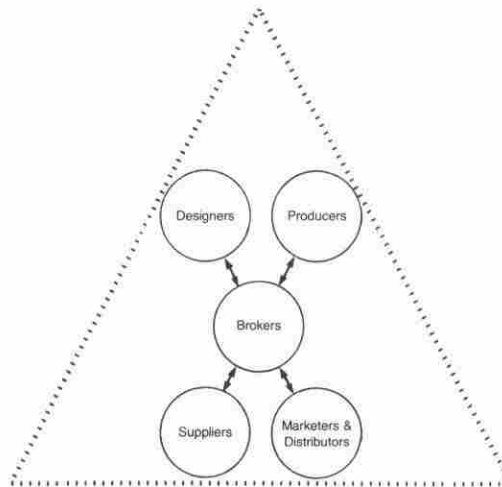
Network organizations are different from previous organizations in several respects. First, over the past several decades, firms using older structures preferred to hold in-house (or under exclusive contract) all the assets required to produce a given product or service. In contrast, many networks use the collective assets of several firms located at various points along the value chain.⁵ Second, networks rely more on market mechanisms than administrative processes to manage resource flows. However, these mechanisms are not the simple "arm's length" relationships usually associated with independently owned economic entities. Rather, the various components of the network recognize their interdependence and are willing to share information, cooperate with each other, and customize their product or service—all to maintain their position within the network. Third, while networks of subcontractors have been commonplace in the construction industry, many recently designed networks expect a more proactive role among participants—voluntary behavior that improves the final product or service rather than simply fulfills a contractual obligation. Finally, in an increasing number of industries, including computers, semiconductors, autos, farm implements, and motorcycles, networks are evolving that possess characteristics similar in part to the Japanese *keiretsu*—an organizational collective based on cooperation and mutual shareholding among a group of manufacturers, suppliers, and trading and finance companies.⁶

Figure 1. Common Network Types

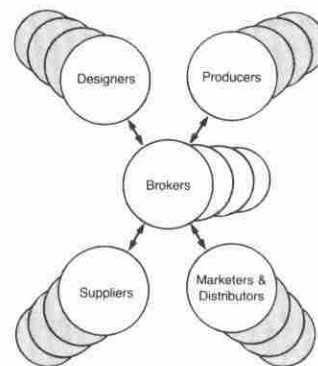
Stable Network



Internal Network



Dynamic Network



Although the network organization exhibits characteristics that are different from previous forms, the stable, dynamic, and internal networks shown in Figure 1 nevertheless incorporate elements of the prior organizational forms as their main building blocks. For example, a functionally organized firm may realize that it needs to outsource the manufacture of certain components, or ally with specific distributors, in order to focus its attention only on those operating activities for which it is best equipped. The result of such changes is a stable network organization: a core firm linked forward and backward to a limited number of carefully selected partners. Upstream stable networks linking suppliers to a core firm are common in the automobile industry. Downstream networks often link computer hardware manufacturers and value-added retailers.

Alternatively, a large multinational matrix organization made up of various design, manufacturing, and distribution units, may decide to replace centrally determined transfer prices with genuine buying and selling relationships among these units. The result is an internal network.⁷

Lastly, in some industries, rapid technological and market changes may encourage a divisionalized firm to disassemble into a multi-player dynamic network of designers, suppliers, producers, and distributors instead of holding all of these assets internally. This is what has occurred over the past twenty years in most publishing firms.

In sum, the network organization in its several variations has sought to incorporate the specialized efficiency of the functional organization, the autonomous operating effectiveness of the divisional form, and the asset-transferring capabilities of the matrix organization—all with considerable success. However, the network form itself has inherent limitations and is vulnerable to misapplication and misuse. To understand the real and potential weaknesses of the network, we need to examine the problems that have plagued (and continue to befall) its predecessor forms.

Causes of Failure in Earlier Organizational Forms

As noted above, a similar evolutionary pattern can be seen in each of the earlier organizational forms. Widespread initial success occurred as the new form provided an innovative arrangement of a firm's resources and a new operating logic responsive to the emerging environment. However, a growing list of failures eventually followed. Some of the causes of failure were obvious—for example, the new form was increasingly, perhaps faddishly, applied in settings for which it was never intended or suited.

The more intriguing failures are those that arise from two types of subtle managerial "mistakes": individually logical *extensions* of the form which in the aggregate push the form beyond the limits of its capability; and *modifications* of the form which, while reasonable on the surface, nevertheless violate the form's operating logic. To fully understand these causes of

failure, it is necessary to first restate the logic of the functional, divisional, and matrix forms and then examine major types of preventable failures against that logic. (See Table 1.)

The Functional Form—The functional form of organization can be thought of as a special-purpose machine designed to produce a limited line of goods or services in large volume and at low cost. The logic of the functional form is *centrally coordinated specialization*. Departments, each staffed with specialized experts in numbers established by a central budget, repeatedly make their contribution to the firm's overall effort in accordance with a common schedule. To be successful, the functional form's specialized skills and equipment must be fully and predictably operated. Firms in the late nineteenth and early twentieth century frequently integrated forward, creating new wholesaling and retailing channels to assure that their output could be efficiently distributed and sold. Similarly, these firms often integrated backward to assure themselves the steady flow of materials and components essential to efficient operation. Today's functional paragons, such as Wal-Mart, are masters at obtaining these kinds of efficiencies, but typically they are not as vertically integrated.

Although vertical integration assures functionally structured firms input and output predictability, it does not come without costs. The further backward and forward a firm integrates, the greater the costs of coordination and the larger the number of specialized assets demanding full utilization. Ultimately, it becomes difficult to determine whether any particular asset along the value chain is making a positive contribution to overall profitability. In fact, the recent trend toward disaggregation (e.g., buying rather than making components, outsourcing sales or distribution) reflects the recognition by many firms that coordination costs and asset underutilization are offsetting the benefits of predictability and hierarchical control.

An example that illustrates these tradeoffs involves the turnaround efforts made at Harley-Davidson in the early 1980s. The motorcycle manufacturer discovered that much of its production inflexibility, along with excessive costs, was caused by attempting to produce virtually all of its own parts and components. A move to a just-in-time inventory system allowed Harley-Davidson to outsource many parts and supplies, reducing its total cycle time and bringing new products to the market quicker while lowering overall costs. What is interesting about organizational "failures" such as that at Harley-Davidson is that managers need not do anything wrong—at Harley, the company's functional structure encouraged internal production of parts and components to assure control. Rather, such systems often fail because managers do too many things right!⁸

Alternatively, the functional organization form will also fail if it is modified inappropriately. The functional organization's logic of centrally controlled, specialized assets does not easily adapt to product or service

Table 1. Causes of Failure in Traditional Organizational Forms

Organizational Form	Functional	Divisional	Matrix
Primary Application	Efficient production of standardized goods and services	Related diversification by product or region	Shared assets between standardized products and prototype contracts (e.g., many aerospace firms) Shared assets between worldwide product divisions and country-based marketing divisions (e.g., some global firms)
Extension Failure	Vertical integration beyond capacity to keep specialized assets fully loaded and/or to evaluate contributions	Diversification (or acquisitions) outside area of technical and evaluative expertise	Expanding number of temporary contracts beyond ability of allocation mechanisms Search for global synergy limits local adaptability
Modification Failure	Product or service diversification that overloads central planning mechanisms	Corporate interventions to force coordination or obtain efficiencies across divisions	Modifications that distort the dual focus (i.e., favor one type of market or product over another)

diversity. A functionally structured manufacturing firm can efficiently produce a limited array of products if demand for the various products can be forecast and productions runs strictly scheduled. However, if the number of products offered becomes too large, or if demand variations interfere with efficient scheduling, the functional form begins to prove inflexible and costly to operate.

For example, after World War II, the Chrysler Corporation rapidly expanded its product line in an attempt to match General Motors' strategy of a "product for every pocketbook." However, while its models proliferated (actually exceeding the number of GM models at one point), Chrysler did not adopt the divisional structure then used by its competitors. Chrysler's mostly functional structure ultimately suffered from losses in efficiency and from added coordination costs as the company attempted to accommodate increasing product variability and complexity. Here, managers

modified key aspects of Chrysler's functional structure for apparently logical reasons, moves that probably were initially successful. However, an eventual array of over seventy different models demanded not just continued structural modification but total restructure—the adoption of a new (the divisional) form.

The Divisional Form—The divisional form of organization can be thought of as a collection of similar special-purpose machines, each independently operated to serve a particular market and all evaluated centrally on the basis of economic performance for possible expansion, contraction, or redirection. The operating logic of the divisional form is thus *the coupling of divisional autonomy with centrally controlled performance evaluation and resource allocation*. The divisional form achieves both flexibility and economies of scope by its ability to rapidly focus clusters of assets on new or expanding markets. It develops a unique competence for evaluating divisional performance in a given set of related markets and for investing pooled returns to promote growth in existing divisions and to create or acquire new divisions. The divisional form also may develop mechanisms for transferring new technology and managerial knowhow across divisions as well as to newly created or acquired operations. Overall, the divisional form's ability to reallocate management knowhow and emerging technology, along with resources generated from existing operations, gives it an advantage in responding to new opportunities and in the cost of startup.

Markets for differentiated goods and services grew rapidly in the 1920s and again after World War II. As described above, the early divisionalized organization at General Motors focused different automobile models on distinct markets, differentiated primarily by price. Similarly, Du Pont identified different types of markets in which its several divisions could use their technical and managerial knowhow in applied chemistry, and Sears Roebuck challenged managers across the country to independently operate "hometown stores with nationwide buying power."

Although divisionalized firms are adept at moving incrementally into related areas, they are also vulnerable to overextension. Most divisionalized firms have had the experience of moving into markets that initially appeared to be appropriate but ultimately turned out to fall outside their area of expertise. Entry into unrelated markets weakens the divisionalized firm's ability to appraise performance and make investment decisions. As the firm moves further away from its unique informational base, its decisions become no more efficient, perhaps even less so, than those the market might make. For example, General Mills, a highly successful divisionalized firm, at least twice extended itself into areas that proved to be beyond its zone of technical and investment expertise, first into electrical appliances and later into toys and fashion goods. In both cases, the firm recognized its own shortcomings and either divested the divisions or moved back from direct operation.⁹

Divisionalized firms are also vulnerable to modifications that begin with good reason but subsequently undermine the form's operating logic. For example, the creation of cross-division committees to share technology, or the creation of a corporate staff group to help coordinate process improvements, may genuinely prove valuable. However, excessive coordination requirements across divisions eventually constrain the divisions' flexibility to meet the demands of their respective markets. Similarly, corporate staff enforcement of interdivisional planning gradually undermines corporate management's ability to accurately assess the individual effectiveness of each division. Both types of modifications, though successful when carefully applied, may expand until they violate the logic of divisional independence and corporate appraisal. Just such extensive coordination requirements constrained, in fact destroyed, the operating autonomy of the separate automobile divisions of General Motors. Initially, in a period of weak competition, the firm enjoyed cross-divisional scale economies without major losses from decreased flexibility and responsiveness. However, under growing competition, GM's complex, interdivisional planning process delayed new product development, and its intrusive coordination mechanisms contributed to unit costs above those of its competition. Most recently, in order to produce a "truly new" car (Saturn), GM had to circumvent its own convoluted structure by creating an entirely new division.

Clearly, in a divisionalized firm, broad operating freedom creates the opportunity for divisions to suboptimize—to take actions that improve their own profitability at the expense of possible overall corporate gains. However, such possibilities are simply part of the normal costs of using the divisional form, offset in the longer run by the benefits gained from well-made local decisions. Unfortunately, fewer and fewer firms today appear to be willing to leave the logic of the divisional form intact. Indeed, many firms that refer to themselves as divisionalized in fact have extensive corporate staff coordination and minimal divisional autonomy. Such operations actually produce all the costs and rigidity of the functional form while adding the cost of divisional duplication of resources. Again, individually sound decisions may add up to overall operating inefficiencies and ineffectiveness.

The Matrix Form—The matrix organizational form can be thought of as a complex machine simultaneously generating two or more outputs for a set of both stable and changing markets. The operating logic of the stable portion of the matrix form is similar to that of the functional form, centrally coordinated specialization. Not surprisingly, the portion responding to unique or changeable markets emphasizes local operating autonomy as is the case in the divisional form. To these dual aspects of its operating logic, the matrix form adds the requirement for *balance among the components to produce mutually beneficial allocations of resources*.

For example, in one type of matrix, an aerospace firm may fulfill a number of long-term contracts to produce a line of standard products in the

functionally structured, stable portion of the organization. Simultaneously, the firm may group a series of project teams around contracts for customized products or prototypes. In this type of matrix, the key contribution of the form is its ability to supply the members of the various project teams through temporary assignment of personnel from the stable departments of the firm. Then, when a project is completed, personnel return to their home departments to work on standard product needs and perhaps await reassignment to another project team. The matrix form gives a firm the capacity to expand and contract and to constantly address new market opportunities while holding key human assets.

In another matrix application, a multi-product, multinational firm may combine worldwide product divisions with national or regionally based marketing groups. Again, the key in a global matrix is to gain the benefits of local operating flexibility while employing resources "owned" by the product divisions.

As with the functional and divisional forms, the matrix form can be overloaded by simply extending a firm's operations beyond the capability of its structure. For example, in the aerospace matrix, each additional project places new demands on the resource-allocation capacity of the firm. Ultimately, resources are held but are not kept fully employed, and the firm achieves something akin to negative synergy—each new logical addition brings with it coordination costs which exceed its benefits.

Equally troublesome are failures of the matrix form resulting from modifications that violate its operating logic. Recall that the purpose of the matrix form is to let two different types of market forces help shape the operation of the firm. However, many firms are unwilling or unable to maintain balance between or among their market foci and functional components. For example, if worldwide product divisions have no means of influencing the marketing priorities of national or regional marketing groups, operating efficiency may be totally subordinated to local responsiveness. Alternatively, if managers of functional departments have full say over assignments to project teams, the needs of the stable portion of the organization will dominate those of the flexible side, making it difficult for project team managers to meet customer needs for both technical sophistication and timeliness.

In sum, there is considerable historical evidence to suggest that an organizational form performs optimally only within certain limits. When a particular form's operating logic is violated, even by apparently reasonable extensions or modifications of the form, failure may result.

Potential Causes of Failure in Network Organizations

Like its predecessor forms, the network organization can fail because of alterations made by well-intentioned managers. The network form has an operating logic associated with each of its variations, and violations of this

logic are likely to limit the form's effectiveness and, in the extreme, cause it to fail.

The Stable Network—The stable network has its roots in the structure and operating logic of the functional organization. It is designed to serve a mostly predictable market by linking together independently owned specialized assets along a given product or service value chain. However, instead of a single vertically integrated firm, the stable network substitutes a set of component firms, each tied closely to a core firm by contractual arrangements, but each maintaining its competitive fitness by serving firms outside the network.

Given its logic, the most common threat to the effectiveness of the stable network is an extension that demands the complete utilization of the supplier's or distributor's assets for the benefit of the core firm. If the several suppliers and distributors in the stable network focus their assets solely on the needs of a single core firm, the benefits of broader participation in the marketplace are lost. Unless suppliers sell to other firms, the price and quality of their output is not subject to market test. Similarly, unless multiple outlets are used, the value actually added by distributors must be set by judgment rather than by market-driven margins. The process of asset overspecialization and overdedication by network partners is frequently incremental and can therefore go unnoticed. Continued, step-by-step customization of a supplier's processes, either voluntarily or at the core firm's insistence, can ultimately result in the inability of the supplier to compete in other markets and an obligation on the part of the core firm to use all of the supplier's output. (See Table 2.)

Another reason for network members to participate in the market outside their relationship with the core firm is to force these components to maintain their technological expertise and flexibility. Suppliers come into contact with innovations in product or service designs and develop their adaptive skills by serving various clients. Overspecialization and limited learning can easily occur if both the core firm and its components are not alert. In fact, for maximum effectiveness, both the core firm and its stable partners must explicitly consider the limits of allowable dedication—forcing themselves to set restrictions on the proportion of component assets that can be utilized.

An enormously effective stable network has been put together by Nike, the athletic shoe and apparel giant. Founded in 1964, as a U.S. dealer for a Japanese shoe firm, Nike began developing its own product line in 1972 and has built a \$3 billion business on a clear strategy of working closely with, but not dominating, a wide range of suppliers in Korea, Taiwan, Thailand, and the Peoples Republic of China. Nike wants its suppliers to service other designers so that they can enhance their technical competence and so that they will be available when needed but not dependent on Nike's ability to forecast and schedule their services. A major factor in Nike's

Table 2. Causes of Failure in Network Organizations

Type of Network	Stable	Internal	Dynamic
Operating Logic	A large core firm creates market-based linkages to a limited set of upstream and/or downstream partners	Commonly owned business elements allocate resources along the value chain using market mechanisms	Independent business elements along the value chain form temporary alliances from among a large pool of potential partners
Primary Application	Mature industries requiring large capital investments. Varied ownership limits risk and encourages full loading of all assets.	Mature industries requiring large capital investments. Market-priced exchanges allow performance appraisal of internal units.	Low tech industries with short product design cycles and evolving high tech industries (e.g. electronics, biotech, etc.)
Extension Failure	Overutilization of a given supplier or distributor leading to unhealthy dependence on core firm	Extending asset ownership beyond the capacity of the internal market and performance appraisal mechanisms	Expertise may become too narrow and role in value chain is assumed by another firm
Modification Failure	High expectations for cooperation can limit the creativity of partners	Corporate executives use "commands" instead of influence or incentives to intervene in local operations	Excessive mechanisms to prevent partners' opportunism or exclusive relationships with a limited number of upstream or downstream partners

continuing market leadership is its ability to introduce new models quickly to meet (or create) market trends. Perhaps most importantly, Nike has maintained its technical competence and leads the industry in R&D investment.¹⁰ Nike personnel work directly with suppliers to build and maintain their capability, verifying product quality in-process as well as after the fact. To assure their own expertise in manufacturing (and to prevent costly design mistakes), Nike has continued a small domestic manufacturing operation focused on leading-edge designs.

The stable network can also be damaged by unthoughtful or even inadvertent modifications. In the search for assurance that suppliers can meet quality standards and delivery dates, some core firms attempt to specify the

processes that the network member must use. Deep involvement in a supplier's or distributor's processes can occur through innocent zeal on the part of the core firm's staff and may be enthusiastically endorsed by the component's staff. Within limits, close cooperation to assure effective linkage is valuable. However, the core firm can ultimately find itself "managing" the assets of its partners and accepting responsibility for their output. Moreover, when the operating independence of the network member is severely constrained, any creativity that might flow from its managers or staff is curtailed—and the core firm is not getting the full benefit of the component's assets. In effect, the core firm is converting the network into a vertically integrated functional organization.

The Internal Network—The logic of the internal network requires the creation of a market inside a firm. Here organizational units buy and sell goods and services among themselves at prices established in the open market. Obviously, if internal transactions are to reflect market prices, the various components must have regular opportunity to verify the price and quality of their wares by buying and selling outside the firm. The purpose of the internal network, like its predecessor, the matrix form, is to gain competitive advantage through shared utilization of scarce assets and the continuing development and exchange of managerial and technological knowhow. But, also like the matrix, the internal network can be damaged by extensions that overload its internal market mechanisms and by modifications that unbalance the relationships between buyers and sellers.

For example, the giant multinational firm ABB Asea Brown Boveri has grown quickly to over \$25 billion in revenues and nearly a quarter of a million employees through a concerted program of mergers and acquisitions which has given it unmatched local and global synergy in the electrical systems and equipment market. To this point, the firm has increased shareholder value by thoughtfully specifying the market domain of each of its components and creating the internal mechanisms by which they can exchange goods and services in mutually beneficial ways under overall market discipline. However, it would be easy for such a firm to be seduced by its current success into an attempt to move further and further afield. At the moment, the CEO and key managers of ABB have a well-articulated concept of how the firm's global internal market operates.¹¹ However, each new business line, and each new geographic area addressed, must be carefully interconnected throughout the global grid, a task whose difficulty increases not arithmetically but geometrically.

Internal networks thus can fail from overextension, but they can fail perhaps even faster because of misguided modification. The most common managerial misstep in internal networks is corporate intervention in resource flows or in the determination of transaction prices. Not every

interaction in the internal network can and should flow from locally determined supply and demand decisions. Corporate managers may well see a benefit in having internal units buy from a newly built or acquired component, even though its actual prices are above those of competitors in the marketplace. Such prices may be needed to sort out the operation and develop full efficiency. However, the manner in which corporate management handles such "forced" transactions is a crucial factor in the continuing health of the network. Ideally, corporate executives will manage the internal economy rather than simply dictate the transfer price and process. This can be accomplished by providing a "subsidy" to the startup component to allow it to sell at market prices while still showing a profit, or by providing buyers with incentives that keep their profits at rates which would occur if they were free to buy from lower priced competitors. Obviously, such subsidies or incentives should be time bound and carefully monitored to prevent abuses. Although this process is demanding, it serves to protect the logic of market-based internal transactions rather than reverting to centrally determined transfers. Unfortunately, as indicated, instead of influencing the internal market and preserving the ability to evaluate components on actual performance, many corporate managers "command" component behaviors and risk destroying agreement on the criteria for performance evaluation.

Despite potential problems, the shift from complex, centrally planned hierarchies to internal market structures is a growing movement, and IBM's recent announcements provide one more large, highly visible example. IBM's plan is to turn each of its major units into self-managed businesses, free to buy and sell goods and services with one another and ultimately with outside buyers and sellers as well. A 1991 conference reported experiments in building internal networks in organizations ranging from services (Blue Cross-Blue Shield), to materials (Alcoa), to low (Clark Equipment) and high tech (Control Data) manufacturers. Not surprisingly, these applications tend to demonstrate both the benefits and the types of resistance anticipated here. However, it is too early to tell whether these and other internal network structures will avoid major managerial mistakes.¹²

The Dynamic Network—The operating logic of the dynamic network is linked to that of the divisional form of organization. Recall that the divisionalized organization emphasized adaptability by focusing independently operated divisions on distinct but related markets. The combination of central evaluation and local operating autonomy is reflected in the dynamic network where independent firms are linked together for the one-time (or short-term) production of a particular good or service. For the dynamic network to achieve its full potential, there must be numerous firms (or units of firms) operating at each of the points along the value chain,

ready to be pulled together for a given run and then disassembled to become part of another temporary alignment.

The availability of numerous potential partners eager to apply their skills and assets to the upstream or downstream needs of a given firm is not only the key to success of the dynamic network, it is also a possible source of trouble. For example, if a particular firm in the value chain over-specializes—refines but also over time restricts its expertise—it runs the risk of becoming a “hollow” corporation, a firm without a clearly defined, essential contribution to make to its product or service value chain.¹³ Firms need to occupy a wide enough segment of the value chain to be able to test and protect the value of their contribution. A designer needs to retain its ability to build prototypes, a producer may need to experiment with new process technologies, and so on. Firms with a contribution base that is either too narrow or weakly defined are easily overrun by their upstream and/or downstream neighbors. Indeed, examples of firms (and industries) pushed into decline and ultimate failure by excessive outsourcing abound. From radios to television sets to video recorders, outsourcing decisions by U.S. corporations allowed foreign suppliers to acquire the technical competence to design and sell their own products, eventually capturing the bulk of U.S. domestic markets.¹⁴

Conversely, firms with a clear competence-based position on the value chain, a base maintained by continuing investment in technology and skill development, can afford to interact confidently with upstream and downstream partners. Nevertheless, there is a constant temptation for firms to go beyond the development of their own competence as the means of insuring their viability. They may seek to add protection through an excessive concern for secrecy, heavy emphasis on legalism in contractual relations, a search for preferential relationships with particular partners, and so on. In fact, potentially dysfunctional network behaviors are currently multiplying across the personal and business computer industry as firms, including industry giants IBM and Apple, build an almost undecipherable maze of interconnected agreements and alliances to protect market share, enter new arenas, search for technical innovations, and promote the adoption of technical and/or system standards. Each of these efforts is designed to give the newly formed partners a competitive advantage over those players not included (who are instead building their own web of alliances).¹⁵ Such protective modifications can constrain the primary strength of the dynamic network—its ability to efficiently allocate member firms, uncoupling and recoupling them with minimum cost and minimum loss of operating time.

In sum, the dynamic network places demands on its component firms to continually reappraise their technical competence and the scope of their activities, not only to maintain their own well-being but that of the broader network as well. No one component can know everything that is happening

or everything that is needed in the broader network. However, each component can preserve its own competence and refrain from behaviors which are a threat to network performance.¹⁶

Avoiding Failure: Developing the Competence for Self-Renewal

In the preceding sections, we have outlined how organizational forms may lose their vitality over time as managers make what appear to be logical extensions or modifications. However, rather than improving performance, these actions may gradually obscure and subvert the operating logic of the form. Few organizations appear to have the capacity for self-renewal—the ability to adapt without losing effectiveness. What is needed is the competence to not only make adjustments to environmental shifts, but to do so either: within the constraints of the operating logic of the existing organizational form; or by adopting a new form to fit a new market strategy. Obviously, the ability of an organization to self-renew is easier to describe than achieve. However, such competence may be enhanced as a firm increasingly adopts characteristics of one of the three network types (stable, internal, or dynamic).

The possibility that firms adopting network structures will improve their self-renewal competence flows from two unique characteristics of the network form: the essential relationships among components are *external* (and thus highly *visible* to all parties) and these relationships are *voluntary* (and thus must reflect *explicit* commitments).

Dynamics of External Relationships—Even when a network's components are commonly owned, the essential structure of the organization is external—an exoskeleton of clearly specified, objectively structured contracts and buy-and-sell agreements that guide interactions rather than internal schedules, procedures, and routines. Conversely, in purely internal communication and reporting channels, every interaction is colored by the hidden threat of hierarchical politics, the likelihood that power and influence rather than performance are guiding behavior. In older organizational forms, for example, cost data and/or performance measures may be manipulated by simply changing accounting conventions—such as the way in which overhead expenses are accumulated and assigned. With external linkages, attempts at personal gain may be made, but the behavior will be much more transparent.

Of course, the fact that network linkages are external does not guarantee that they will always be efficacious to each of the parties, but it does push the parties toward performance-based equity. A number of years ago, we predicted that network organizations would create “full-disclosure information systems” to assure that all decisions were made objectively and fairly.¹⁷ Such practices are now quite common. As the CEO of Excel Industries, a major supplier of Ford, states: “They know every cost we incur.”¹⁸

In sum, visible, external linkages among network components have perceptual as well as substantive benefits. A faulty external coupling must be dealt with, while purely internal mechanisms can be eroding or even broken for some time before the damage demands the affected parties' attention.

Dynamics of Voluntary Relationships—External, visible relationships, as suggested, tend to be explicit. They specify the performance that is expected from each partner and how that performance will be measured and compensated. Explicitness, however, does not require complex, legalistic, or highly formal contracts. A contract can be as simple as a due date and a price based on disclosed costs. In the construction industry, “partnering” sessions are held among network members at the beginning of major projects to clarify responsibilities and relationships and to agree on methods of resolving disputes. Similarly, General Electric’s Workout Program is designed to bring GE’s managers, customers, and vendors together to create effective working relationships.¹⁹

Most importantly, the fact that network relationships are explicit does not mean that they are dictated by one party or another. In fact, underlying all of the positive characteristics of network structures is the dynamic of voluntarism. If voluntarism is not present—if partners are not free to withdraw from relationships they believe are unfairly structured—then the value of openness and explicitness is compromised. Of course, such compromises can and do occur, as noted earlier. For example, in stable networks, components may become overly dependent on one another, and in internal networks corporate interventions may force components into relationships that are neither fair nor appropriately subsidized.

Nevertheless, U.S. firms are gaining experience at creating and maintaining fair and voluntary relationships. For example, Harley-Davidson claims it is no longer “waging war” with its suppliers. Harley’s managers reportedly “threw the lawyers out” and produced a simple contract that clarified goals for suppliers and outlined how disputes could be resolved.²⁰

In sum, the unique, positive characteristics of the network organization discussed here can assist managers in making adaptations by enabling them to test their proposed modifications and extensions against the operating logic of the form. Because changes are visible and clear to all parties in the network, there are likely to be multiple players tracing the impact of any change. Moreover, the key characteristic of the network form, voluntarism, is in itself a litmus test of logic violation—*any* change that reduces voluntarism is a potential threat to the overall efficiency of the network.

Conclusion

Research over the past decade has increasingly confirmed what managers and organizational theorists have long understood—organizations, particularly large, complex firms, have a difficult time responding to changes in

their competitive environment. Instead of adapting incrementally as market and/or technological changes occur, managers tend to wait until environmental demands accumulate to crisis proportions before attempting a response, and then they often fail. When managers do behave incrementally, they frequently make patchwork alterations to the existing organization as each new market or technological shift occurs but without considering the ultimate systemic impact. Such adjustments gradually move the organization away from its core structural logic, creating an idiosyncratic system highly dependent on a few key individuals or units to function. These organizations are not only unstable and costly to operate, they often are so convoluted that it is difficult even to determine where major change might begin—to get to the center of a complex organizational knot.

Our premise here has been that organizational forms, particularly the network form, need not be so prone to failure. If managers understand the logic of the form their organization employs, and if they keep that logic visible to themselves and others associated with the organization, the benefits of proposed changes can be weighed against the strains they impose on the total system. In fact, we believe that it is possible to anticipate how and why each organizational form is likely to fail. Moreover, if managers understand the operating logic of alternative forms, they can explore the possibility that environmental changes have pushed their organization outside the boundaries of one form and into those of another.

Finally, we have tried to illustrate how the network form should help make the manager's task of successful adaptation easier. By its very nature, the network organization is always in the process of renewal—its important elements are in a constant state of adjustment to market, technological, and other forces in the environment. This continual process of adaptation, coupled with the fact that network components are typically smaller and more focused than those of integrated firms, should help managers deepen their understanding of the form's operating logic and develop their renewal skills.

Whether the network form of organization is less prone to internally generated failures than its predecessors is ultimately determinable only over time. Nevertheless, its evolution provides managers the opportunity to explore and test their understanding of organizations from a new vantage point, and the continued study of networks should contribute to a better understanding of the causes of success and failure in all organizational forms.

References

1. During the early and middle 1980s, articles began to appear (a) *forecasting* network forms of organization [e.g., Raymond Miles and Charles Snow, "Fit, Failure and the Hall of Fame," *California Management Review* (Spring 1984)]; (b) *describing* the form's key characteristics [e.g., Hans Thorelli, "Networks: Between Markets and Hierarchies," *Strategic Management Journal* (January/February 1986); and Raymond Miles and Charles Snow, "Network Organizations: New Concepts for New Forms," *California Management Review* (Spring 1986)]; and (c) *debating* the costs and benefits of network structures [e.g., "The Hollow Corporation," *Business Week*, March 3, 1986]. A few years ago, a rash of books and articles appeared exploring and generally endorsing various types of network structures, including strategic alliances, value-added partnerships, global market matrices, and so on [e.g., Peter Drucker, *The New Realities* (New York, NY: Harper & Row, 1989); Charles Handy, *The Age of Unreason* (Boston, MA: Harvard Business School Press, 1990); Robert Reich, *The Work of Nations* (New York, NY: Knopf, 1991); Russell Johnson and Paul Lawrence, "Beyond Vertical Integration—The Rise of the Value Added Partnership," *Harvard Business Review* (1988)]. Most recently, a cover story in *Business Week* ["Learning From Japan," January 27, 1992, pp. 52-60] details numerous examples of U.S. firms creating and benefiting from network structures.
 2. For a brief description of both Rubbermaid and Wal-Mart, see the Special Report, *Business Month* (December 1988), pp. 38 and 42.
 3. For an early discussion of how large firms have disaggregated their operations and spread them across multiple, smaller elements along the value chain, see Michael J. Piore and Charles E. Sabel, *The Second Industrial Divide* (New York, NY: Basic Books, 1984). See also Johnson and Lawrence, *op.cit.*
 4. A more detailed description of these three types of networks, and the forces shaping them, is provided in Charles C. Snow, Raymond E. Miles, and Henry J. Coleman, Jr., "Managing 21st Century Network Organizations," *Organizational Dynamics* (Winter 1992), pp. 5-20.
 5. Cooperative, entrepreneurial behavior of this sort is being increasingly encouraged both inside and across firms. See James Brian Quinn and Penny C. Paquette, "Technology in Services: Creating Organizational Revolutions," *Sloan Management Review*, 31 (Winter 1990): 67-78.
 6. There are two main types of *keiretsu*. Many stable networks in the U.S. resemble "supply" *keiretsu*, which are groups of companies integrated along a value chain dominated by a major manufacturer. To date there are no American counterparts to "bank-centered" *keiretsu*, which are industrial combines of 20-45 core companies centered around a bank. For discussions of *keiretsu*-like networks in the U.S., see Charles H. Ferguson, "Computers and the Coming of the U.S. *Keiretsu*," *Harvard Business Review* (July/August 1990), pp. 55-70; and "Learning From Japan," *Business Week*, *op. cit.* See also "Japan: All in the Family," *Newsweek*, June 10, 1991, pp. 37-40.
 7. IBM announced a major restructuring along these lines late in 1991. See "Out of One Big Blue, Many Little Ones," *Business Week*, December 9, 1991, p. 33. For a complete description, see David Kirkpatrick, "Breaking Up IBM," *Fortune*, July 27, 1992, pp. 44-58.
 8. Thomas Gelb, "Overhauling Corporate Engine Drives Winning Strategy," *The Journal of Business Strategy* (November/December 1989), pp. 91-105.
 9. See General Mills, Annual Report, 1985.
 10. See Nike, Annual Report, 1991.
 11. See William Taylor, "The Logic of Global Business: An Interview with ABB's Percy Barnevik," *Harvard Business Review* (March/April 1991), pp. 91-105.
-

12. See, Jason Magidson and Andrew Polcha, "Creating Market Economies Within Organizations: A Conference on Internal 'Markets'," *Planning Review*, 20 (January/February 1992): 37-40.
13. *Business Week* used the term "hollow corporation" pejoratively in its March 3, 1986 cover story, op. cit. However, recognizing that thoughtful outsourcing does not cause an organization to lose its critical expertise, Quinn, Doorley, and Paquette discuss how firms are "learning to love the hollow corporation." See James Brian Quinn, Thomas L. Doorley, and Penny C. Paquette, "Technology in Services: Rethinking Strategic Focus," *Sloan Management Review*, 31 (Winter 1990), p. 83.
14. These and other examples are discussed in companion articles in the February 1992 issue of *The Academy of Management Executive* [Richard A. Bettis, Stephen P. Bradley, and Gary Hamel, "Outsourcing and Industrial Decline," pp. 7-22; and James A. Welch and P. Ranganath Nayak, "Strategic Sourcing: A Progressive Approach to the Make-or-Buy Decision," pp. 23-31]. However, while both pieces bemoan the negative impact of faulty outsourcing decisions on U.S. competitiveness, each recognizes that outsourcing, if properly handled, can be an important management tool, and Welch and Nayak propose models to assist with strategic outsourcing decisions.
15. See James Daly and Michael Sullivan-Trainor, "Swing Your Partner, Do-Si-Dough," *Computerworld*, December 23, 1991/January 2, 1992, pp. 21-25.
16. In contrast to the widely publicized and potentially damaging alliances emerging among major computer firms, many small Silicon Valley firms have built profitable dynamic network relationships. In these networks, many firms do nothing but design custom computer chips while others specialize in manufacturing these designs. In some instances, designers have even shared some of their expertise with large concerns in return for access to manufacturing competence. Such networks emerge and are maintained by trust and by the recognition of unique competencies and mutual dependencies. See John Case, "Intimate Relations," *INC.* (August 1990), pp. 64-72.
17. Miles and Snow (1986), op. cit., p. 65.
18. "Learning From Japan," *Business Week*, op. cit., p. 59. Similar relationships based on full cost and profit information sharing among Silicon Valley chip designers and manufacturers are described in John Case, op. cit.
19. Snow, Miles, and Coleman, op. cit.
20. "Learning From Japan," op. cit., p. 59.