

COMMUNICATED KNOWLEDGE AS A LEARNING FOUNDATION

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Organizational learning capabilities are embedded in organizational communication systems and processes related to knowledge creation and articulation. The emergence of new organizational forms (such as horizontal organizations) in rapidly-changing environments and hyper-competitive markets underscores the need to better understand these foundational sources of learning. In fact, the reason horizontal organizations may find success is that their structure is intended to promote communications systems and processes which enhance a knowledge-response sequence similar to a stimulus-response sequence associated with learning. These systems permit managers to quickly gather information, respond with agility in making decisions, and continue to make ongoing adjustments. Firms which understand the need to build their communications capabilities may be characterized as meta-learning organizations. Resource-based theory suggests that communications systems and processes are thus sources of competitive advantage. Future empirical research on organizational learning may progress by evaluating specific measures of communication process as proxies for learning processes.

We all sense that the changes surrounding us are not mere trend but the workings of large, unruly forces: the spread of information technology and computer networks; the dismantling of hierarchy, the structure that has essentially organized work since the mid-19th century. Growing up around these is a new information age economy, whose fundamental sources of wealth are knowledge and communication rather than natural resources and labor. (Stewart, 1993, p. 66)

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Evidence suggests the occurrence of a basic global shift in the organization of work. Both the volume and pace of external technological change have served to create hypercompetitive markets, where an organization's ongoing responsiveness to changing conditions and customer demands becomes strategically paramount (D'Aveni, 1994). Organizing strategies which emphasize relaxation of traditional notions of management control have abounded in response to these new competitive demands. The characteristics of these organizations emphasize flatter hierarchies, decentralized decision making, greater capacity for tolerance for ambiguity, permeable internal and external boundaries, empowerment of employees, and capacity for renewal (Daft & Lewin, 1993; Lewin & Stephens, 1993). The names by which such new organizational efforts are referred often include reengineering, cross-functional teams, continuous improvement, downsizing, and horizontal organizations. The goals of these evolutionary designs are to enhance lissomeness and agility, and to nurture the ability to learn and to adapt.

At the same time, rapid advances in information technology have both enhanced the opportunity for such new organizational forms to succeed and created potential stumbling blocks. On the one hand, new technology such as electronic mail, shared database applications, and GDSS may facilitate direction of and connections between organizational subunits enjoying greater responsibility and autonomy. On the other hand, the new forms and technology require "solutions that alter existing dependencies . . . throughout the organization, particularly in the case of interdepartmental or interfunctional relationships" (Buitendam, 1987, p. 60). In addition, the new forms and technology may act in concert to produce an overload of information (Farace, Monge, & Russell, 1977; Huber & Daft, 1987) about the competitive environment in which the organization exists.

The creation of the horizontal organizational form (Ostroff & Smith, 1992) is one response to the need to better manage changed dependencies between the organization and its environment, and among the subunits within the organization. Both the design and functioning of such postindustrial organizations (Lewin & Stephens, 1993) are expected to afford strategic advantage in the face of rapidly-changing competitive contexts and a virtual deluge of information about those contexts.

Yet, several heroic assumptions underlie these experiments in new organizational forms, and in particular the horizontal organization. The relationship between financial performance and these new forms must be better understood. For example, IBM's significant downsizing and reorganization in the mid 1990s has resulted in substantial cost savings, but its implications for longer term strategic performance remain unclear. Broader evidence exists that many firms which have attempted to implement popularized notions such as re-engineering (Hammer & Champy, 1993) have not performed as well as expected (Byrne, 1995). Many firms may simply be imitating the practices of other industry players without really understanding how or why such reorganizations will work (DiMaggio & Powell, 1983; Huff, 1982; Lippman & Rumelt, 1982). Firms adopting new organizational forms are doing so without much guidance (Daft & Lewin, 1993).

The present paper explores a theoretical premise for the experiments now underway. In particular, this paper develops an argument that communication-based learning is a necessary foundation upon which the horizontal organization must build, in order for firms which adopt this form to successfully develop competitive advantage.

Interest in the concept of the learning organization has co-evolved with interest in the horizontal organization. Changes such as mass customization, product life cycle compression, and time-based competition mandate an organizational form with enhanced organizational learning capabilities (Dixon, 1992; Fiol & Lyles, 1985; Huber, 1991; Levitt & March, 1988). More broadly, fundamental to seemingly discontinuous changes and new bases for competition is the compelling need to rapidly reduce barriers to understanding for managing the monumental challenges in the new globally competitive landscape. D'Aveni (1994) argues that in this new era of hypercompetition the emphasis on traditional strategic thinking embodied in the pursuit of a single sustainable position of competitive advantage is nearly obsolete, such that a series of new arenas of competition constantly unfold before organizations. The arena of timing and know-how competition, together with the rapid technological change and the coincident progression of competition from one arena to another, emphasize the need to understand and respond quickly (D'Aveni, 1994; Tushman & Anderson, 1986). Effective strategies will thus depend more on the "development and deployment of intellectual resources than on the management of physical and fiscal assets" (Quinn, 1992, p. xiv). Enhancing organizational stocks of know-how and intellect underscores the need for more effective organizational learning capabilities.

The emergence of new organizational forms and the growing need for enhanced organizational learning capabilities are not coincidental. The rationale for a combination of structure and process which emphasizes quickness of decisions to create and sustain competitive advantage is that companies need to become fast, agile, and "boundaryless" (Welch, 1993, p. 82), and be able to continuously "change and solve problems through interconnected self-organizing process" (Daft & Lewin, 1993, p. i). Learning capabilities that yield fast adaptation represent internal organizational capabilities which will create sustainable competitive advantage for horizontal organizational forms. In the resource-based view of the firm (Barney, 1991; Dierickx & Cool, 1989) such capabilities are rare, valuable, and not easily substituted or imitated. Thus the co-evolving combination of form and process provides a means to achieve ongoing competitive advantage.

This paper holds that organizational learning capabilities are embedded in organizational communication processes designed to create knowledge and deploy intellectual resources. Others suggest that the evolution of new organizational forms, such as horizontal structures, proceeds "without the guidance and benefit of theories and models that would characterize the new paradigm" (Daft & Lewin, 1993, p. i), and that "building an ideal type theory of network organizations" is now required (Lewin & Stephens, 1993). Effective and efficient communication networks within organizations foster learning by assisting the creation of new

knowledge and by providing access to existing objective and tacit knowledge. Communication process-based learning is particularly important for emerging organizational forms, which exhibit less structure and formal channels than traditional organizational forms.

A communication process through which knowledge is created and becomes organizational is delineated. Previous research on organizational learning has relied upon the concept of shared or created knowledge as evidence of organizational learning (Duncan & Weiss, 1979), and has treated knowledge almost as if it is a tangible factor to be transferred among organizational members (Leonard-Barton, 1995; Tompkins, 1995). However, previous research on organizational learning has not presented an account of how knowledge develops. The focus herein on communication process as an underlying foundation for knowledge creation and learning provides one such account, and presents an opportunity to integrate the cognitive and behavioral aspects associated with organizational learning (Lundberg, 1995). The focus on communication networks also serves to bridge between individual and organizational levels of learning (Lundberg, 1995; Rahim, 1995).

Furthermore, this paper argues that sustainable competitive advantage relies on excellence in organizational communication systems and process, represented by the meta-learning capabilities of organizations. Meta-learning organizations are those which learn how to learn, because they assume and are able to articulate multiple new realities on an ongoing basis. Meta-learning organizations are seen as being acutely sensitive and responsive to rapidly-changing environments.

The design of this article is first to briefly review the origins and functioning of the horizontal organization as the prototypical new organization form. Enhanced communication processes underlie the design of this type of organization. In the next section the argument that communication systems and processes are a foundation for knowledge creation is presented. The communication-knowledge link is then shown to inform traditional views of organizational learning; and the concept of meta-learning (the learning organization) is shown to fundamentally focus back on the organization's communication systems and processes. The arguments will then be framed in the context of the resource-based view of competitive advantage. A theoretical model is presented which captures the essence of the relationships between organizational communication, knowledge creation, and competitive advantage. Propositions are presented which identify learning and meta-learning capabilities of organizations as residing in aspects of communication processes. A concluding discussion outlines further issues for managers and researchers to consider.

Information Needs Mobilize Evolution to New Organizational Forms

The history of management thought has long debated the most effective and efficient structures for pursuing strategy and competitive advantage. Bureaucracy and hierarchy have dominated the preferred structures in both private and public

domains. Classical scholars, such as Fayol and Weber, and administrative theorists paved the way for hierarchy as the necessary organizational model for the efficiency needed. Chandler's (1962) work extolled the virtues of hierarchy through the M-form as a means to accomplish several strategic goals, including economies of scale and of scope. Subsequent to the administrative theorists, debates regarding "organic" versus "mechanistic" organizations (Burns & Stalker, 1961) and "open systems theory" (Katz & Kahn, 1976) until recently were more academic exercises than serious issues to most managers. For the most part managers and executives organized and reorganized their structures into hierarchical, essentially bureaucratic variations.

Hierarchical structures have served companies quite well in the past. This is in part due to the advantages they have afforded in specialization and resulting functional excellence (Ostroff & Smith, 1993). More importantly, hierarchical structure reflected management's desire for command and control as a way of conducting work. Control was facilitated through top-down "unity of command" and "unity of direction" (Fayol, 1949). Information flowed up and decisions flowed down through lines of authority from top management, who made the critical entrepreneurial and strategic decisions (Chandler, 1962). Interestingly, Chandler's insights on the appropriateness of hierarchical structure as following strategy derived from his view of the complexity of changes in the world and the economy, changes which required upward flow of data and information, and its aggregation at the highest levels.

Hierarchical structures, however, do not offer a means to effectively coordinate among functions and divisions at the sub-unit level. The considerable informational distance between divisions when following the paths in a hierarchy produces inefficiency in innovation and fragmented efforts building on core competences. This results in "complex mixtures of noncomplementary products" as well as inconsistent strategic implementation throughout the organization (Hoskisson & Hitt, 1994). Thus lack of coordination is a central defect of these structures (Ostroff & Smith, 1993).

In addition, hierarchies serve to slow down the speed of response to market-initiated issues and changes. Data and information must first flow upward through lines of communication to those who have the authority to make strategic decisions. Decisions must then be communicated back down the hierarchy. Those with authority may only be able to attend to a limited set of issues (Mintzberg, 1971), potentially leading to further delays in the organization's response to received stimuli.

Today the complexity of changes are orders of magnitude greater than was the case for Chandler's studied companies; many factors are conspiring to create hypercompetitive conditions (D'Aveni, 1994). Flexible, aggressive, and innovative responses are thus viewed by many academics and practitioners as the tools required of organizations. In this environment problems of bureaucratic inertia and lack of cross-functional or cross-divisional coordination interfere with rapid response to changes (Buitendam, 1987). Poor communication across divisions and

lengthy channels of communication between hierarchical levels also stifles the kind of competitive responses made and the rapidity with which they are made. Hierarchical organizations are therefore ill-equipped to meet the challenges presented by the dynamic competitive landscape today.

An attempt is underway to release the stranglehold of bureaucratic inertia which has gripped modern corporations (Daft & Lewin, 1993; Mezas & Glynn, 1993). Many practitioners and academics believe a more horizontal mode of organizing (Ostroff & Smith, 1993) provides performance advantages. The "horizontal" organization epitomizes the set of lateral relations which Galbraith (1973) envisioned as a solution to increasingly complex and uncertain environments. Lateral relations increase the capacity for processing information (Galbraith, 1973). Cross-functional teams work to reorient the organization to systematic understanding of end-to-end workflows and processes, prompting employees to become more supplier- and customer-oriented. The customer is then viewed as the ultimate source of determining the meaning of value-added. The need to manage across the value chain creates an empowered management and workforce by pushing the level of decision making down to where the requisite information exists. This constellation of conditions has in part led to increased attention on and enhanced goals for quality and continuous improvement, and has begun to reveal ways in which these enhanced goals may be reached. Corporations such as GE, AT&T, Kodak, Motorola, Ryder, Allied Signal, DuPont, Royal Dutch/Shell, and Chrysler have instituted variations on the horizontal organization.

Such innovative designs are evolutionary in the sense that resulting structures allow the organization to move beyond its current capabilities because organizational boundaries become less clear (Mezas & Glynn, 1993). The silo thinking associated with tightly defined functions or departments (Dearborn & Simon, 1958) is avoided; greater sharing of common concerns and greater integration between departments or organizations becomes possible.

The effect of horizontal forms is to increase responsiveness to changing conditions impacting competitive advantage. Hammer and Champy (1993) illustrate the potential impact of effective horizontal reorganizations. IBM Credit empowered individual credit managers to handle a complete loan application, reducing turnaround time from six days to four hours. Hallmark Cards created cross-functional design teams, cutting new greeting card development time from over two years to under one year.

New Forms Rely on Organizational Communication

Organization form and communication structure are indelibly intertwined (Jablin, 1987; Tompkins, 1987), and an examination of the horizontal organization also reveals fundamental reliance on communication processes within the firm. Enhanced contacts with customers and suppliers, as well as linked processes internally, depend on the facile exchange of ideas and information. Ownership and empowerment call for pushing out to all quarters in the organization the responsibility for proactive decision behavior, and with it the understanding of strategies

and goals along with the information required to be proactive. Problems identified by members of cross-functional teams need to be clearly and rapidly communicated to other team members in order for the benefits of teamwork to be manifested. An orientation toward end-to-end workflows places a premium on common language and communications which effectively bridge functional or divisional differences (Fiol, 1994; Grant, 1993). Quality improvement depends on social interactions between organizational members in order to first surface tacit knowledge revealing sources of and impediments to quality (Reger, Gustafson, DeMarie, & Mullane, 1994; Winter, 1994), and then on effective communications to diffuse important findings to the rest of the organization (West, 1995; Winter, 1994).

Well-developed communication processes also strengthen the desired connections between the organization and the changing environment (King & Cushman, 1994). Enhanced communication processes increase the connections of the organization's technical core (Galbraith, 1973) to supplier and outlet markets, thereby making it more responsive to these markets (Buitendam, 1987). They also strengthen coordination within the organization in developing a collective understanding of dynamically changing conditions, and in forming a strategic response to such changes.

Thus we see that communication processes are at the epicenter of these quick and agile enterprises. The structure of the organization provides a formal opportunity for enhanced flow of information. However, the nature of communication among organizational members is substantively what drives quicker response and superior competitive position. King and Cushman (1994) point out that where traditional sources of competitive advantage are pursued, such as cost leadership or differentiation, organizational communication acts as a second-level support activity to basic organization around manufacturing or research and development. But where speed of response time becomes the fundamental source of competitive advantage, such as that pursued by horizontal organizations, then organizational communications become the primary organizational focus (King & Cushman, 1994).

This is a fundamentally different view of dealing with environmental uncertainty than that proposed by Thompson (1967). Thompson's argument is that in a complex, turbulent, and uncertain environment an organization must buffer its core technology from perturbations, thus reducing the effects of environmental changes on the organization. Here we find that organizations feel the need to strengthen the connections between ongoing changes in the environment and what the organization is supposed to do exceptionally well at its core. According to Thompson, an organization in a complex environment creates specialized boundary spanner roles to act as gatekeepers to information flowing into the organization (Rogers & Agarwala-Rogers, 1976). Now we find that organizations are seeking to develop many points of contact with external environments in order that information flowing into the organization may be increased.

While these views are very different, both would seem to point to the need to better understand processes of information flow and exchange within organiza-

tions. If we acknowledge that complex, changing and uncertain environments produce volumes of information and potentially increased organizational uncertainty, then understanding the dimensions of information processing within organizations can lead to a better understanding of how new organizational forms may be successful in responding. While important sources of new information about changing environments include formal scanning processes (Aguilar, 1967) and individual boundary spanners (Cohen & Levinthal, 1990; Thompson, 1967), research has demonstrated that more effective communication channels for developing alternatives and solutions are those that exist between members within the organization (Allen, 1966; Allen, Lee, & Tushman, 1980; Winter, 1987, 1994). Therefore, in the next section we turn to a discussion of information processing and communication between members within an organization.

Communication Process as a Source of Knowledge Creation

Processes and properties of communication are fundamental to economic organizations. Increasing variety evident in economic systems in the modern era (Saviotti, 1988), together with the rise of sophisticated information technologies and management information systems (Stonier, 1991), has "aggravated the organizational dilemma inherent in having too much random data in the world and too little ordered information in the organization" (Widalvsky, 1983, p. 29). Thus organizational communication theorists (Huber & Daft, 1987) have specifically linked organizational communication processes (e.g., scanning, probing, message routing, message summarizing) and channel characteristics (symbolic interactionism, media richness) with the degree to which organizations understand their environments and act upon such understanding.

From Information to Meaning

Communication theorists have been helpful in understanding how communication processes affect organizations. Foundational work in the field holds that information refers to freedom of choice when one selects a message, and in this sense can be said to represent the uncertainty of a situation (Shannon & Weaver, 1964). For example, in a situation characterized by great uncertainty, many possible choices of messages about the situation exist; therefore, a wide range of information possibilities to describe the situation are available. Similarly, where many possible choices of messages exist, greater uncertainty prevails. On the other hand, in a situation where less uncertainty exists, the number of possible message choices about the situation is limited, and thus a more restricted range of information exists. Thus "information in communication theory relates not so much to what you *do* say, as to what you *could* say" (Shannon & Weaver, 1964, p. 8). Out of all the possible choices of what could be said about a particular situation, what in fact is said begins to direct and shape the perception and understanding of the situation. As a result, the process of selecting and transmitting information becomes of paramount importance.

Just as the choice of information about a situation begins to define the situation, so too does the conveyance of that information through organizational communication channels (Daft, Bettenhausen, & Tyler, 1993; Krone, Jablin, & Putnam, 1987; Shannon & Weaver, 1964). Different channels of communication, such as face-to-face, telephone, written documents like memos and letters, or teleconferencing, have varying degrees of information richness (Daft & Lengel, 1984) and information capacity (Daft & Huber, 1986). Because of the characteristics of channels through which possible information about a situation is communicated, the messages received by members of an organization may differ from the information itself.

Finally, the recipient of organizational communications may employ biases in evaluating and interpreting messages received from other members within the organization (Krone et al., 1987). Because managers employ biases and heuristics in interpreting their environments, the meaning of the received message may be different from the intended meaning the sender of the message had in mind.

These views highlight two critical characteristics of organizational communications. First, there is a clear distinction between information and meaning for organizational members. Information is a characteristic of the environment which an organization faces (this could include both the external and internal environments). Information about the environment is selected by individuals, and is then transformed by the channels of communication used and the cognitive filters employed by the recipients. As a result the meaning of information received is different from the information which originally generated the message. Information is thus transformed into meaning through communication processes.

Second, and more importantly, these ideas suggest that the focus of interest in organizational communication should be the communication *relationship* between individuals (Rogers & Kincaid, 1981; Scott, 1991). A focus on the relationship thus includes all three components which impact the use of information in organizations: the sender, the channel, and the receiver. Such a focus is precisely the orientation of communication network analysis (Monge & Contractor, 1988; Richards, 1985; Rogers & Agarwala-Rogers, 1976; Rogers & Kincaid, 1981; Tichy, 1981; Wigand, 1988). Moreover, when an organization is viewed as a network of relationships (Stohl, 1995), the difficult theoretical issue of individual versus organizational level of analysis is diminished because the examination of the individual's relationships with other organizational members focuses attention on the transition from one level to another.

From Individual to Organizational

The development of meaning as a result of communication between individuals is the first step toward the creation of organizational knowledge. The transformations of information leading to incipient meaning enable its extension and refinement. Where an individual generates meaning created through incipient information transformation processes, others may add to, enhance, and improve on the meaning. For example, one may recognize that the situational context commu-

nicated is similar to a previously-experienced situation and offer an additional perspective on action possibilities. Or someone may "tag" a certain aspect of communicated meaning with an additional nuance, and by doing so open the door for greater adoption potential for the perspective throughout the organization. In short, subsequent communication among organizational members allows for the progressive modification of insight and meaning within an organization, or conversely for the rejection and discarding of individual insights or perceived meanings which others find inappropriate.

Iterative communication between organizational members is an integral part of the progressive transformation of information into meaning and then into organizational knowledge. Rogers and Kincaid (1981) stress that reciprocity is an integral part of effective communication, and is a key to understanding the nature of effective communications and the diffusion of new ideas in network organizations (Rogers, 1983). Rather than being a directional communication relationship, the reciprocal non-directional communication relationship between organization members is important in refining and shaping new insight so that it may be effectively incorporated into and build upon existing organizational practices and strengths.

Through progressive, iterative and reciprocal communication about the incipient meaning, organizational members tend to converge on a shared perspective and an area of mutual understanding (Rogers, 1986; Rogers & Kincaid, 1981). In this manner the perspective and meaning developed initially by an individual may ultimately become an organization-wide asset, through validation among other organization members. It is in the sense of validation by other members that Nonaka (1994) refers to organizational knowledge as "justified true belief" (p. 15). It is only organizational because it is a view of the organization in context which has become collectively shared. In this regard Roszak (1986) writes that the fundamentally great ideas which motivate organizations and nations are those which are the result of generalizing across many participants a "sensible, connecting pattern" when confronted with a "vast, shapeless welter of facts" and information (p. 88).

Several authors who have explored conceptual differences between knowledge and information lend support to these ideas. For example, Nonaka (1994) characterizes knowledge as justified true belief which is created and organized by the semantic (content) and syntactic (process) aspects of information transmission. "In terms of creating knowledge, the semantic aspect of information . . . focuses on conveyed meaning" (Nonaka, 1994, p. 16). The semantic aspect stresses the nature of information in context; conveyance stresses its transformed properties through communication processes. Similarly, knowledge represents more than having facts and bits of information; it suggests knowing "why" and knowing "wherefore" based on developed understanding and insight (Adler, 1986). Insight, in turn, has a prescriptive character, and indicates the knowledge that something ought to be done in a certain way (Adler, 1986). Such useful knowledge—that which is assessed to have potential for producing goal-related outcomes—is seen as arising from a progressive and iterative modification of that which is currently known by

the infusion of new information and perspectives (Kilmann, Slevin, & Thomas, 1994).

Thus, transformed information leads to the creation of organizational knowledge. Where the receiving entity is a human system which puts transformed kinetic information into a context, integrates it with other structural information, and is able to "respond in a manner which enhances its chances of survival" (Stonier, 1991, p. 261), the transformed information is characterized as intelligence. Similarly, Saviotti (1988) views the transformation of information in organizations as a process which critically affects the organization's ability to adapt to the environment. The conversion of environmental data into meaningful information enhances organizational knowledge, and more conclusively guides decision making (Widalvsky, 1983).

Communication processes within a firm create unique, firm-specific knowledge about the competitive environment. Firms acquire information about competitive environments, and that information is in turn transformed within the firm through the firm's idiosyncratic communication processes. Routines and direction within organizations in part determine the type of information acquired and how it is then diffused (Cohen & Levinthal, 1990; Grant, 1993; Nelson & Winter, 1982). Together with other idiosyncratic aspects of a firm, such as its existing strategy and related boundary spanning activities, communication within a firm is uniquely directed and focused and is different from communication within competing firms. Each firm may develop knowledge similar to that which other firms also develop, purely as a function of the nature of the information symmetrically available from the environment. But the unique direction, focus, and transformation of information within a firm's boundaries as a result of its communication processes lead to the creation of unique knowledge which cannot easily be imitated or developed by other firms.

Management theory has recently focused on two dimensions of knowledge which are particularly important for firms to consider: tacit knowledge and explicit knowledge (Nelson & Winter, 1982; Nonaka, 1994; Spender, 1993). Tacit knowledge represents organizational capabilities which are embedded in routines, are unobservable, and are difficult to change as a result. It contributes to unique competitive advantage through the path-dependent development of capabilities (Cohen & Levinthal, 1990; Nelson & Winter, 1982). But at the same time it may constrain the firm's ability to assess and respond to changing environments (Cohen & Levinthal, 1990; Levitt & March, 1988). As a result, the ability to share and articulate tacit knowledge—in other words, to make it explicit—has most recently been viewed as the critical factor in generating competitive advantage. Spender (1993) concludes, therefore, that competitive advantage will arise from "the interaction of different types of knowledge, or of different types of people" (p. 17). The different types of knowledge to which he refers include both explicit and tacit knowledge at both the individual and social level. Social interaction processes are required, and in organizations these processes are essentially communication processes between individuals and groups of individuals (Weick, 1969). Thus Winter (1987) holds

that "the failure to articulate what is articulable may be a more severe handicap for the transfer of knowledge than tacitness itself" (p. 172).

In sum these ideas emphasize organizational knowledge as socially constructed (Blackler, 1993; Nonaka, 1994; Von Krogh, Roos, & Slocum, 1994). The development of organizational knowledge is seen as being highly contextual, dependent upon the ways in which individuals interact in attempting to understand the environment. Organizational knowledge is also seen as being dynamic, subject to change as the environment, the perceiving individuals, and/or their interpersonal communication relationships change.

In a competitive landscape characterized by dynamic technological transformation and rapid competitive moves and countermoves, communication processes which facilitate the creation and articulation of knowledge are ever more critical. Echoing the remarks of Wildavsky (1983) made earlier, in such environments the need for systems which can handle the increases in information flows is paramount. Horizontal organizational forms which have supportive communication processes in place hold great promise for learning how to respond to dynamic conditions. These organizations have greater points of interception with markets and can gather more information about changing conditions. In addition, the structure of the organization allows for enhanced sharing of such new information between individuals in different departments. Nonaka (1994) thus argues that "the interactions between tacit knowledge and explicit knowledge will tend to become larger in scale and faster in speed as more actors in and around the organization become involved" (p. 20).

We now turn to a discussion of the relationship between knowledge development through organizational communication and organizational learning. Propositions are then developed which formalize the arguments developed herein.

Communicated Knowledge and Organizational Learning

New knowledge informs the firm that new practices may be warranted. Knowledge which a firm develops regarding possible new capabilities may direct the firm to alter its intended strategy and resource investments. Similarly, knowledge developed about changing competitive conditions may prompt consideration of alternative strategies or the development of new capabilities. Where a firm comes to understand that the range of its potential behaviors has been or should be changed, organizational learning has occurred (Huber, 1991). Duncan and Weiss (1979) therefore define organizational learning as the development of a new knowledge base.

Most organizational learning models are predicated on a basic stimulus-response concept (Argyris & Schön, 1978), wherein relationships between actions and outcomes come to be better understood (Hedberg, 1981). In such models learning focuses on the detection of differences between outcomes and the expectations for outcomes created via theories-in-use (Argyris & Schön, 1978). Correction of any differences results in refinements of theories-in-use (single-loop learn-

ing) or the application of new theories-in-use (double-loop learning), both of which may be evidenced by changed organizational actions. Fiol and Lyles (1985) similarly discuss these relationships in the context of lower level versus higher level learning.

Seldom discussed in the organizational learning literature is the concept of third order learning. Third order learning is learning about higher level, double-loop learning—i.e., learning how to learn (Bateson, 1972; McWhinney, 1992). With rapid technological transformations continually recreating competitive landscapes, the ability of organizations to learn how to learn is strategically important.

The next sections explore the connections between communicated knowledge and the different levels of learning. In particular, an argument is made that developing higher level and third order learning capabilities may be a fundamental to producing competitive advantage, and these capabilities increasingly rely upon organizational communication systems.

Lower Level Learning

There are multiple contributions which communication systems make to guiding lower level, single-loop organizational learning. First, organizational learning is path-dependent, and is facilitated by existing communication routines (Cohen & Levinthal, 1990; Levitt & March, 1988; Nelson & Winter, 1982). Routines for search, attention, and goal setting provide direction for the acquisition of new information (Cyert & March, 1963; Nelson & Winter, 1982). Established communication patterns and routines provide channels and a context for the interpretation and storage of new information and knowledge (Huber, 1991), and for the retrieval of memorized information and knowledge (Dixon, 1992).

In addition, capabilities are refined and improved based upon the specialization within frequently used procedures (Levitt & March, 1988). The ability to specialize is enhanced to the extent that organizations provide direction for the communication of complex knowledge (Demsetz, 1993; Grant, 1993). Capabilities are also refined and improved as a result of the investment in absorptive capacity within a particular domain (Cohen & Levinthal, 1990). Inasmuch as the existing stock of learning in a particular domain is manifested by routines reflecting that cumulative investment, learning to enhance capabilities also depends on routines (Cohen & Levinthal, 1990; Dierickx & Cool, 1989; Levitt & March, 1988; March, 1991). Such routines "provide a mechanism for integrating tacit knowledge . . . where communication mainly takes the form of signals between members . . . [which] assist the sequencing of individual actions" (Grant, 1993, p. 7). As discussed previously, the development of tacit knowledge in the form of organizational routines also depends on effective communications among organizational members about desired practice.

Higher Level Learning

Higher level, double-loop learning is of particular interest to strategists (Fiol & Lyles, 1985) and those considering the structural characteristics of an organiza-

tion related to strategy. By definition, higher level learning involves redefining the rules by which an organization intends to operate as a result of changes in the shared interpretations of its members. In essence, higher level learning is manifested by changes in strategy and structure, and in strategic resource investments.

In dynamic, rapidly changing competitive environments organizations face two problems in achieving higher level learning. In these environments high-consequence events (Levitt & March, 1988) occur with increasing rapidity, but the characteristics of the events change along with the environment. Therefore, firms are never presented with identical stimuli from which to learn appropriate stimulus-response sequences (Weick, 1991). In addition, by the time the effects of changes in strategy become known and understood to organizations, the competitive landscape will already have dramatically changed. A linear, sequential stimulus-response process therefore does not serve strategists or researchers well in understanding how organizations may effectively learn and respond under such rapidly-evolving conditions.

Organizational communication systems which create new knowledge also facilitate learning at higher levels, even in rapidly changing environments. The result of knowledge creation is the awareness of new perspectives which might direct the organization into new sets of activities and resource investments. Organizations learn that new approaches might have relevance for their competitive position. At the same time new knowledge exposes that existing approaches firms have used may be less effective in emergent competitive landscapes.

One aspect of communication process would seem to be particularly important in aiding higher-level organizational learning: the exposition of embedded sources of competitive advantage. The communication of new information and the articulation of tacit knowledge highlights the importance of new internal capabilities and sources of strategic advantage not explicitly considered by strategy makers previously. For example, Winter (1994) discusses how competitive advantage may be enhanced through quality improvement, which involves delayering tacit knowledge about TQM practices into articulated components. By articulating tacit components of a quality program, critical leverage points may be identified and focused upon to determine potential for further improvement. Reger et al. (1994) also use the example of changing TQM practices as a means of accomplishing strategic renewal. They propose that organizations need to create "cognitive connections" and "cognitive oppositions" to core organizational identity constructs in order for managers to reframe what is central, enduring, and distinctive (Albert & Whetten, 1985) about their organization. But "organizational identity is . . . based on deeply ingrained and tacit assumptions" (Reger et al., 1994, p. 569) which need to be surfaced before the connections and oppositions can be made. Expanding on the need to better understand tacit elements, Nonaka (1994) therefore argues that "realizing the practical benefits of [tacit] knowledge centers on its externalization and amplification through dynamic interactions" (p. 20).

The concept of articulable knowledge provides insight on sources of higher-order organizational learning. As mentioned above, the traditional S-R (stimulus-

response) learning model is inappropriate for strategic management, where the effects of strategic actions are by definition long term. Where organizations articulate knowledge incorporating perceptions of dynamic, rapidly-changing conditions and new internal capabilities, however, a K-R (knowledge-response) model provides the opportunity for managers to make continual improvements in strategy. In this view learning reflects an ongoing social reconstruction of the organization's knowledge regarding its situation, followed by an appropriate organizational response. While on the surface this view might suggest learning only relies on events which have already occurred, recent research highlights the critical importance of yet-to-be-experienced events in managing strategy (West, 1995), and of adeptly managing inter-temporal choices and resource allocation decisions (Judge & Spitzfaden, 1992; Laverty, 1993). This is essentially the thrust behind Senge's (1990) work in microworlds, where managers are trained to anticipate events yet to be experienced and to make strategic decisions on such anticipation. Moreover, the articulation of alternative forms of organizational knowledge may help organizations better define their own identities (Fiol, 1991; Reger et al., 1994). We conclude that the knowledge creation perspective therefore allows for both unlearning and learning to occur simultaneously, a condition which Fiol (1991) argues is crucial for managing competences to develop strategic advantage.

Communication systems have a second important role in organizational learning and unlearning. They not only aid in the assembly of new perspectives, but importantly they also aid in the dissemination of new perspectives and new directions as well. These systems enable those who decide to make changes in strategy and strategic resource investments to communicate to the rest of the organization that changes are being made and the reasons for the changes, and to monitor the progress of implemented changes. Thus communication systems are important in both strategy formulation and in strategy implementation (Daft et al., 1993).

Communication Informs Traditional Sources of Higher Level Learning

Levitt and March (1988) discuss four sources of organizational learning, all of which depend critically on communication. *Learning by direct experience* results from the strength of the connections between environmental stimuli and organizational responses. To the extent these connections are quickly made with great clarity to organizations, learning is enhanced (De Geus, 1988). Characteristics of communications systems including media richness (Daft et al., 1993; Daft & Weick, 1984), and channel characteristics which affect message routing, summarizing, modification, and delay (Huber & Daft, 1987) also impact the strength of connections between the organization and its environment.

The horizontal organization providing multiple points of contact between the organization and the environment strengthens the connections between the two. It calls for communication systems and processes which can effectively assemble diverse information and perspectives arising from multiple points of contact. Thus Hamel (1991) theorizes that where a firm has several individuals involved in col-

laborative strategic alliances, learning will occur where horizontal institutional communication systems are not fragmented. To be effective such systems facilitate the transfer individual knowledge to others and enable an aggregation of perspectives.

To the extent communications systems foster parallel processing of information regarding environmental events and organizational actions, organizations may be able to make strategic adjustments simultaneously with evolving market conditions. Horizontal organizations with supportive communication systems push the sources of information gathering, knowledge creation, and decision making out to multiple interception points with the market. These strengthen the connections between the environment and the organization, and serve to overcome the sequential process of stimulus-response dictated by more vertically structured organizations.

Interpretations of history rely upon the sharing process among organization members of individual perspectives. Communication among members affords the opportunity for integrative and consensual organizational response (Duncan & Weiss, 1979). Fiol (1991, 1994) holds that integration and consensus on shared perspectives may occur around the context of communications among firm members as much as around the content of the communications. Just as language "rules underlie and govern the meanings of our words" (Fiol, 1991, p. 197), communication systems provide context and direction for the interpretation of content. Managing competences such as culture (Fiol, 1991) or facilitating learning through building new collective understandings (Fiol, 1994) critically depends on characteristics of the communication system such as context, rules and boundaries, and the ability of the system to develop and converge on shared language.

Retrieval of knowledge from organizational memory assumes that such knowledge has been transferred into such memory structures to begin with. Established communication patterns and routines provide channels and context for the storage of new information and knowledge, and for retrieval of memorized information and knowledge (Dixon, 1992). As evidence, West (1995) finds that certain top management team communication patterns may promote established ways of thinking strategically and impede the development of new strategic insights. Specified routines for search, attention, and goal-setting provide direction for the acquisition of knowledge from organizational memory (Cyert & March, 1963; Nelson & Winter, 1982). Hamel and Prahalad (1994), for instance, point out that the auto industry relies heavily on their studies of historical trends in order to better understand developing consumer needs and direct R&D investment. This reliance by Ford led to the rejection of the development of the minivan, while Chrysler did pursue the minivan project after deciding to use a different routine for estimating consumer preference.

Finally, *learning from the experience of others* depends on the transfer of such experiences into and throughout the organization. Cohen and Levinthal (1990) stress the importance of organizational communication systems in encouraging the transfer of knowledge across and within subunits. In a study of learning

within international strategic alliances, for example, Hamel (1991) finds that Japanese firms involve many people in meetings with their Western partners. Consequently information is not compartmentalized within these Japanese firms. The Western partners, on the other hand, refrain from involving anyone without a direct interest in what is being discussed, with the result that effective organizational learning does not occur and several Western companies are still unable to proceed effectively without the continued involvement of the alliance. Hamel (1991) concludes that "firms with a history of cross-functional teamwork and inter-business coordination were more likely to turn personal learning into corporate learning than were firms where the emphasis was on 'individual contributors' and 'independent business units'" (p. 98). The lesson here is that effective organizational learning contributing to competitive advantage critically depends on systems which communicate new knowledge from individuals throughout the firm.

Meta-Learning: The Learning Organization

In the descriptions of and practices leading to third order learning capabilities, organizational communication systems again constitute an integral foundation. First order learning calls for refinement of an existing and operating dominant logic through stimulus-response interaction facilitated by organizational communications. Second order learning places communication processes centrally in the effort to identify and communicate the existence of competing logics, to build consensus around these, and to disseminate information about the adoption of a new logic. Third order change *assumes* the existence of competing logics (McWhinney, 1992). Consequently, those who manage organizations in developing third order learning capabilities emphasize communication processes which continually articulate multiple new realities, and which facilitate exchange and dialogue among members to arrive at choice among competing perspectives (McWhinney, 1992). Organizations which effect transformation not merely through additions or substitutions of knowledge, but which instead learn to simultaneously conceptualize different and contradictory forms of knowledge (Fiol, 1991) have been characterized as meta-learning organizations (Lei, Hitt, & Bettis, 1994; Prahalad & Bettis, 1986).

The distinction which the concept of third order learning offers is a critical one in the emerging area of organizational learning theory. Argyris and Schön (Argyris, 1994; Argyris & Schön, 1978, 1996) argue that organizations must overcome defensive routines in order to accomplish double-loop learning, and to effectively modify the logics or strategies which guide them. To do so organizations must inquire about existing learning processes (Argyris & Schön, 1996). Where single-loop learning focuses on making adjustments to an existing strategy and double-loop learning focuses on substituting one operating strategy for another, third level meta-learning focuses on the methods of organizational inquiry which lead to conclusions about the need to change the operating strategy.

As the competitive landscape rapidly and continually changes, great advantage may accrue to organizations which develop communication systems supporting meta-learning. The assumption underlying meta-learning—the existence of

logics which compete with that currently operated under—precisely matches the nature of the environment, where rapid and continual change present the need for changing the organization's dominant logic.

GE is one example of an organization pursuing meta-learning capabilities through its workout process. The company schedules and promotes these meetings designed to identify problems with what exists and propose new solutions; workout session leaders are selected for the willingness to take risks and challenge the status quo (Tichy & Charan, 1989). Chaparral Steel, a small U.S. minimill, leads the world in productivity in large measure due to its willingness to experiment with new methods and its managerial systems designed to create and diffuse new knowledge about manufacturing techniques throughout the company (Leonard-Barton, 1995). Communication systems which support the ongoing collection, interpretation, distribution, and integration of change information enable organizations to develop meta-learning capabilities.

Horizontal organizations which are accompanied by supportive communication systems are particularly well-suited to develop and utilize meta-learning capabilities. Exhibiting many points of contact with the competitive environment, these organizations are perfectly positioned to generate contradictory forms of knowledge; to create a dialectic within management about the preferred operating logic through effective transfer of competing perspectives throughout the organization; and to implement changes resulting from revolutionary thinking back through the organization.

The structural form of horizontal organization, however, is not what creates these conditions for success. What does mobilize the organization for success is the communication systems producing these exchanges. Argyris and Schön (1996), for example, point out that the success of such structures depends on the tolerance for dissent and debate within the organization and the embracing of risk which goes hand in hand with decision making under uncertainty. Where defensive individual reasoning and organizational routines are prevalent, no type of flattened organizational structure is likely to encourage managers to think about contradictory forms of knowledge or theories-in-use (Argyris, 1994). Overcoming such defensive practices through the creation of dissent, debate, and uncertainty is the critical condition which precipitates changes in theories-in-use. The horizontal organizational form is a structure which offers the likelihood to more effectively manage the uncertainty created by increased information flows when defensive practices are overcome.

Communication-Based Learning: The Resource View

Resource-based theory focuses on internal resources and capabilities as sources of competitive advantage. In the early development of the resource-based view resources were considered to be like tangible assets, in the sense that they were defined as factors discoverable in imperfect factor markets (Barney, 1986) or as accumulated stocks resulting from resource investments (Dierickx & Cool,

1989). This approach to theory has been labeled the structural school (Schulze, 1994).

More recently, theorists have focused on a view of critical resources as being constituted by intangible processes within firms. Prahalad and Hamel (1990), for example, suggest the core competence of the corporation is the capability to coordinate diverse skills and integrate multiple streams of technologies. Grant (1991) also finds that capabilities are complex patterns of resources coordination. In this process view, then, competitive advantage arises to the extent that managers create higher order organizing principles which orchestrate the sharing and communication of knowledge throughout the firm (Grant, 1993; Kogut & Zander, 1992; Teece, Pisano, & Shuen, 1992).

The process school view of resources emphasizes the importance of ongoing recreation of firm's strategic capabilities. Barney (1991) comments that a resource-derived position of competitive advantage may evaporate when the environment changes. In a similar vein D'Aveni (1994) argues that "today's strengths become tomorrow's weaknesses so quickly that sustaining advantages is nearly impossible" (p. iv). Thus while a resource or capability confers competitive advantage under a particular constellation of competitive and environmental conditions, that resource or capability may not continue to confer advantage after conditions shift. As a result, firms need to be continually recombining their resources and recreating their capabilities. Such a dynamic capabilities approach holds that a firm's true distinctive competence is its capacity to renew, augment, and adapt its core competences over time (Teece et al., 1992). This capacity is driven by the existence of a Schumpeterian world of exogenously-induced changes (Teece et al., 1992), a worldview remarkably similar to that facing most organizations today. Within this theoretical perspective the factors contributing to organizational learning thus assume a primary role in the derivation of competitive advantage.

Empirical work on resource-based theory is in its incipient stage (Barney, 1991; Conner, 1991; Schulze, 1994). The present paper focuses its attention on the process school as it is being manifest in new organizational forms. Given the premise argued earlier that these new forms have a common foundation architecture of more effective and efficient organizational communications, propositions regarding the relationship between aspects of firm performance and organizational communication process are developed. We have argued that communication processes serve to create forms of knowledge within organizations. While this is an assumption in the theoretical development, we recognize it may also be considered a fundamental proposition which needs empirical verification. Thus we state the relationship formally in our first proposition:

Proposition 1: Communication processes enhance the creation of both tacit and explicit knowledge.

The process and dynamic capabilities perspectives of resource theory point to communication processes as a critical element which yields competitive advantage. Amit and Shoemaker (1993) emphasize that developing or learning new capabili-

ties is a result of complex interactions and exchanges of information through the firm's human capital. Interactions in organizations are essentially communication processes between individuals and groups of individuals (Weick, 1969).

The pervasiveness of the importance of communication on the development of internal strategic capabilities becomes manifest in recent discussions which attempt to establish a "knowledge-based" perspective of firm competitive advantage (Grant, 1993; Nonaka, 1994; Spender, 1993). These authors identify knowledge as a strategically important resource possessed by the firm. Organizational capabilities are viewed as the product of competencies in the integration and application of this knowledge. The knowledge perspective links communication as the pervasive, underlying force responsible for the recognition, creation, dissemination, and maintenance of strategic capabilities.

The knowledge-based explanation of the development of internal strategic capabilities is structured within two continua: individual versus collective levels, and tacit versus explicit knowledge (Nonaka, 1994; Spender, 1993). Strategic capabilities result from new knowledge creation accomplished through processes which combine the tacit knowledge of individuals and the organization with explicit knowledge of the organization. The articulation of tacit knowledge into explicit knowledge exposes the core dimensions of organizational capabilities which create competitive advantage. Thus identified, organizations may move to build on them with greater assurances of success. Having a better understanding of factors contributing to quality, as a consequence of delayering tacit knowledge, will enable management to more effectively apply quality principles throughout the organization (Winter, 1994). Communication processes are paramount, as well, in transfers of knowledge from objective to tacit dimensions. First by communicated direction, followed by signaled routine (Grant, 1993), effective new approaches and practices may then become institutionalized within the organization.

Proposition 2: Communication processes which enhance shared knowledge among organizational members will lead to improved internal strategic capabilities.

Learning new capabilities also requires a common code of communication and coordinated search procedures (Teece et al., 1992) among members of the firm. Since higher-level learning depends on a knowledge-response relationship, systems and patterns of communication which enhance stimulus information flows, knowledge creation and refinements, and communicated responses also enhance the possibility for learning. To the extent that organizations continue to learn by iterating through cycles of knowledge creation and response (Fiol, 1994; Van de Ven & Polley, 1992), systems and processes which enhance the reciprocation and iterative communications will serve to enhance learning.

Where organizations attempt to deal with situations and circumstances yet to be experienced, anticipatory learning must occur. Here organizations rely upon the identification and iterative discussion of estimated possibilities in the development

of knowledge regarding future competitive environments. After an organization has arrived at a consensus on new ideas or new initiatives to be explored, reciprocation among all members of the organization facilitates the diffusion and adoption of such new ideas and their marriage to the acknowledged existing strengths of the organization (Rogers, 1983; Rogers & Kincaid, 1981; West, 1995).

Proposition 3: Effective and efficient communication processes facilitate rapid learning about and development of new strategic capabilities.

Organizations may come to realize the learning benefits which enhanced systems and processes of communication provide. As communication processes work continuously over time to enable organizations to identify new capabilities and implement new strategies and resource investments, these organizations will begin to search for the reasons behind their sustained performance differences. Effective communication processes will facilitate the identification of factors in internal organizational environments which contribute to these performance differences. Ultimately, effective communication processes within organizations may enable organizations to see that learning depends on effective communication process itself. As argued earlier, these processes generate contradictory forms of knowledge, a dialectic within management, and revolutionary thinking.

Proposition 4: Effective and efficient communication processes facilitate meta-learning.

It would be logical to assume that if a horizontal organizational form is implemented, there exists at some level a management conviction that performance and competitiveness will improve. As has been argued, the success of the horizontal form is based upon the organization's communication systems. Empirical evidence lends support to the potentially positive effects which organizational communications may have on firm performance. Smith et al. (1994) find that informal communication among top managers is positively related to social integration, which in turn is positively related to measures of firm performance. Coordination across top management team members from different functional areas of an organization runs parallel to coordination in horizontal organizations. "Such teams may operate as efficient clans, not needing to expend extra energy and resources on group maintenance. These behaviors appear to be especially important in high-velocity environments, a result also implied by Eisenhardt and Bourgeois (1988)" (Smith et al., 1994, p. 432). In addition, West (1995) finds that communication between future-oriented and present-oriented top managers in technology companies is significantly associated with prospective strategic change. At the same time this study finds that communication among like-minded top managers was unrelated to strategic change initiatives. Together, these findings suggest that enhanced communication among heterogeneous organizational members leads to enhanced abilities to create new organizational perspectives and manage toward performance improvement. Where the horizontal organization form is intended to create

stronger connections between heterogeneous functions and divisions within the organization, the implications of these findings are quite strong. The following propositions are therefore suggested:

Proposition 5: Firms with horizontal organizational forms will achieve competitive advantage if they have effective and efficient organizational communication processes supporting the structural form.

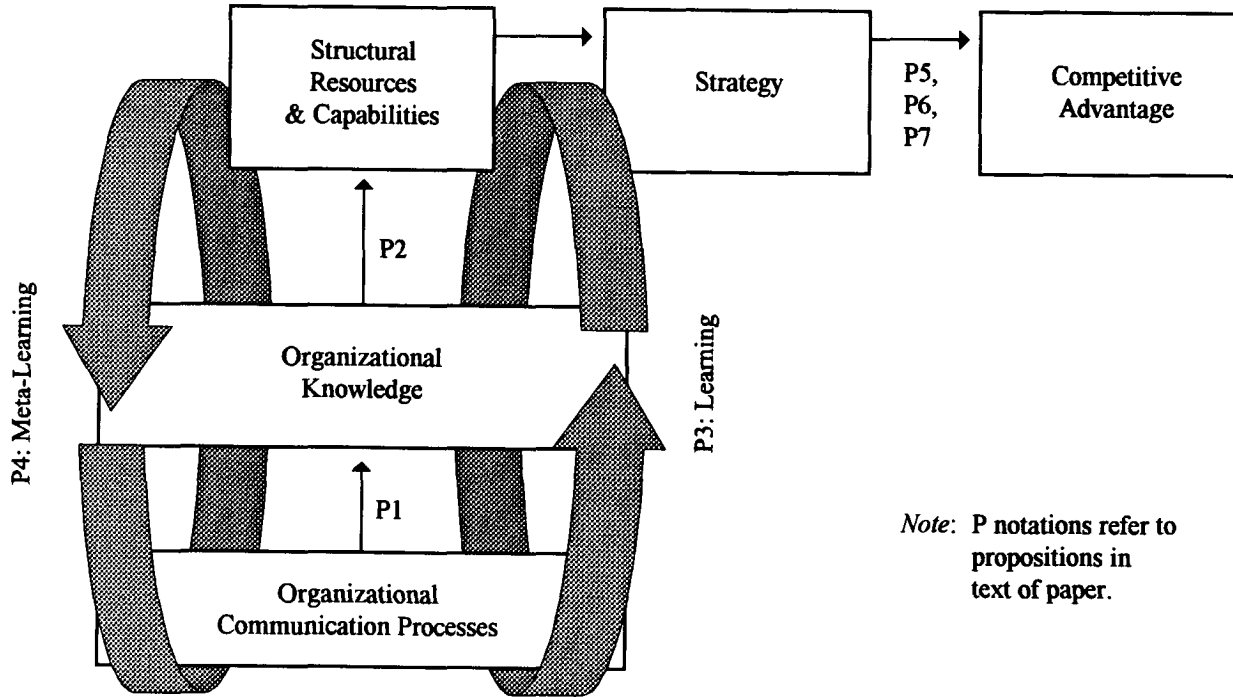
Proposition 6: Firms with horizontal organizational forms and effective and efficient organizational communication processes will achieve competitive advantage over hierarchical organizational forms.

Proposition 7: Among firms with horizontal organizational forms, differences in competitive advantage will be explained by the effectiveness and efficiency of organizational communication processes.

The foundation of new organizational forms are organizational communication processes and the knowledge these processes create and disseminate. Figure 1 provides a glimpse of the relationships between strategies, resources, and performance proposed in this paper. Resources and capabilities work through strategies to produce performance and financial indicators of such performance. Both structural and process resources and capabilities affect performance through competitive advantage. However, sustainable competitive advantage and superior performance depend on processes which update and upgrade the resource position of the firm. Thus structural resources are wrapped within the context of the organization's process capabilities. Quicker, renewable agile process capabilities are what is required to "erode the advantages of large and established players" (D'Aveni, 1994, p. 1).

The bedrock foundation upon which strategy, resources, and performance are built is organizational learning through communication processes. Strategy formation, resource acquisition and development, and day-to-day performance itself are increasingly dependent on communication processes which augment knowledge. Organizational knowledge (both tacit and objective) is the derivative second foundation of effective and efficient organization communication processes. Thus it is communicated knowledge which is the fundamental tool to maneuver in hyper-competition. Enhanced knowledge of dynamically changing landscapes, competitive conditions, and of the organization itself is the direct foundation upon which resources and capabilities are discovered and built. Finally, as communication processes create new knowledge and new capabilities are thus discovered, organizations learn to modify strategies in order to sustain competitive advantage and superior performance. Thus organizational learning is reflected in Figure 1 by the feedback loop which begins and ends with "resources and capabilities" and the "strategies" which follow.

Figure 1
Relationships of Levels of Learning to Organizational Communications, Knowledge, Resources, and Strategy



Organization communication processes and a quickly-evolving knowledge base are at the foundation of combinative learning processes which yield competitive advantage, even in dynamic environments. In the resource-based view, then, communication process is valuable, rare, non-substitutable and inimitable (Barney, 1991; Dierickx & Cool, 1989) by less capable competitors. It is valuable because it creates unique, firm-specific knowledge and continuous learning about routes to competitive advantage for the firm in its environment. A communication process is rare because it derives from a unique constellation of organization and actors. It is not easily substitutable; firms often have difficulties over years in reorganizing and restructuring. And it is not easily imitable; the characteristics which make an organization's communication process and tacit routines particularly effective are bound to be causally ambiguous (Lippman & Rumelt, 1982) to interested outsiders. Especially when horizontal organizational forms and processes stimulate the migration of explicit knowledge to tacit routines will competitors be unable to mimic the communicated knowledge resource. Thus, communication process, together with the knowledge it creates, can become a valuable capability to meet the challenges of rapid technological change and hypercompetitive landscapes. Previously-cited corporate experiments in horizontal organizational forms take direct aim at developing such knowledge-based communication capabilities in order to create and sustain competitive advantage in domestic and global markets.

To the extent that organizations recognize the value of and proactively manage their communication processes, they may be characterized as meta-learning organizations. Organizations may observe that learning occurs via enhanced communication processes facilitating knowledge creation and the development of valuable strategic capabilities. These organizations may seek to focus, in turn, on enhancing their communication process capabilities. Thus they will learn how to learn. This meta-learning capability is reflected in Figure 1 by the feedback loop which begins and ends with "organizational communication processes."

Implications for Management and Research

Seven propositions have been offered as a conclusion to the theoretical development in this paper. The propositions represent a unique confluence of perspectives from strategic management, organizational learning, and organizational communications. One agenda for future research is to disaggregate each of these propositions into working hypotheses for empirical tests.

Five of the seven propositions refer to "effective and efficient communication processes." The focus on organizations as networks, and the linking of communication to the knowledge-response learning and meta-learning loops, are suggestive of ways in which effectiveness and efficiency of organizational communications may be conceived. Efficiency may be conceptualized in two ways. First, it may represent the extent to which fewer channels of communication are used and/or fewer messages need be sent in order to create a specific meaning with the mes-

sage receivers. Alternatively, efficiency may represent the extent to which reciprocation and iterative communication between senders and receivers are not needed in order to deliver a specific understanding. Communication effectiveness, on the other hand, implies changes in knowledge or behavior (Rogers & Agarwala-Rogers, 1976). Consistent with the concept of knowledge developed herein as justified belief among the set of organizational actors, organizational communication effectiveness would therefore represent the extent to which a fundamental dominant logic of the organization is modified and attendant strategic behavior reflects such modification.

Cast in these terms, efficiency and effectiveness of organizational communication systems and processes are not necessarily supportive of each other. At the extreme highly efficient communication processes may rest on highly refined common language or awfully short channels of communication, and may inhibit the kind of reciprocation and iteration which characterizes the search for innovative new ideas. Thus peak efficiency may not be consistent with peak effectiveness. Years ago Barnard (1938) claimed that establishment of sound organizational communication was one of three principal functions of executives, and discussed the necessary balance between effectiveness and efficiency as a pivotal issue for organizations. While we suggest possible conceptualizations of effectiveness and efficiency, future research is needed in order to more completely dimensionalize these concepts as well as moderators to their relationships with organizational learning.

The tension which organizational communication processes must deal with is therefore that which exists between the generation of too many new ideas and the convergence of the organization on a limited number of better ideas. Too many ideas or too much information may overload the system and the managers within it; too rapid a convergence on a new idea or limited set of ideas may prevent the organization from substantively considering an optimal set. Thus in consideration of organizational strategic renewal efforts a number of researchers have highlighted the need for an appropriate level of differentiation of perspectives followed by integration of perspectives among management (Bartunek, Gordon, & Weathersby, 1983; Chakravarthy, 1982; Ginsberg, 1990; Hurst, Rush, & White, 1989). Recent empirical research finds that moderate levels of both differentiation and integration of strategic perspectives are positively associated with improved performance, while deviations from such moderate levels are associated with performance decrements (West, 1996).

For managers the seven propositions are suggestive of new ways to consider sources of competitive advantage. First, changes in organizational communication systems and processes should parallel changes in organization structure. When firms move away from hierarchical organization and its commensurate lines of reporting and information exchange, revised organization communications dynamics become the glue that binds the flatter organization together. The substantive nature of exchange among members is changed in horizontal organizations; both formal and informal communication systems must be designed and

implemented alongside changes in structural reporting relationships. Otherwise, functional or operating managers may become more isolated, and find it ever more difficult to transfer critical new perspectives and information to the rest of the organization. Under these circumstances, organizational learning may in fact decline.

This suggests, secondly, that management needs to consider communications beyond those which are offered through formal mechanisms of organization structure. The essence of horizontal organizations is structure with fewer formal channels and reporting relationships. This type of structure implies autonomy and self-direction on the part of discrete organizational subunits. Electronic systems and accessible databases may facilitate connections among now-removed, independent sub-unit managers. But management must also create opportunities for substantive discussion and dialogue, where refinement of ideas and newly-acquired information may lead to new organizational knowledge and to the subsequent diffusion of such knowledge throughout the firm. Management needs to encourage reciprocating communication among divisions which provides feedback and feed-forward (Rogers & Agarwala-Rogers, 1976). Simply designating cross-functional teams may be insufficient for addressing changing dynamics effectively; management must discover other formal and informal ways in which such team members may communicate with each other regularly and substantively. Such discovery remains a vibrant challenge for managers and action researchers.

These ideas suggest that a key challenge for the management of a learning organization involves a new form of executive leadership. The effective horizontal structure is designed to place the organization in greater contact with its markets, which should enhance the generation of multiple new possibilities for the organization in terms of overall strategic direction. Where the structure promotes autonomy and self-direction, management must increasingly find ways to achieve consensus among potentially disparate subunits and to avoid the dysfunctional consequences of prolonged conflict within the organization (Narayanan & Fahey, 1994). Management of learning organizations must therefore concern itself even more with the management of meaning and identity for the organization.

Enhanced systems of communication are not costless, and thus both managers and researchers need to better understand the sources of potential gain and loss associated with them. Smith et al. (1994), for example, study the effects of communication frequency and informal communication on firm performance. Their results were the opposite of those expected, finding that communication frequency is negatively related to performance. West (1995) observed that the dynamics and effects of communication differ depending on subsegments within the top management team. Thus partitioning individuals and groups into segments may reveal different dynamics and relationships than those observed for the organization as a whole. Managers and researchers need to understand the benefits of enhanced systems of communication compared to the costs of creating and maintaining them. If effective communication depends on the selection of participants, then managers

and researchers need to better identify the tradeoffs for firms in implementing enhanced selection and evaluation programs as an overlay to communication systems.

Through its communication systems management should embrace ongoing change in order to develop meta-learning capabilities. The diffusion of new ideas within the organization enables the horizontal organization of value-adding activities to maximize agility and responsiveness to the market. This suggests continually searching for new systems to capture developing information and to communicate it throughout the organization. The institutionalization of one effective method may soon be outdated by market changes and competitive moves. These ideas follow from the arguments earlier, which implied that organizational knowledge is both socially constructed and emergent.

In order to understand better how to design communication systems to embrace learning, both managers and researchers need to better understand conditions under which change ideas are dismissed or repressed. For example, the strategic planning exercise performed annually by many companies is a directed form of communication, where guidelines and adherence to a strict timetable allow restricted occasion for creative thinking. Where positive strategic change depends on a continual flow of ideas and reciprocal and refining exchanges among top managers (West, 1995), the annual planning process does not serve this purpose. Furthermore, the agendas of powerful managers (Bowman & Bussard, 1991), the availability of resources (Cyert & March, 1963), and other factors may impact the extent to which organizational members search for and communicate new ideas. The design of communication systems which produce both ideation and organizational guidance, while accounting for factors such as these, thus remains a key challenge for both managers and researchers.

Empirical investigation of the proposed relationships may provide a means to better understand the foundations of effective organizational learning. Findings may provide sound prescriptive advice for organizations undergoing or considering reorganization, particularly those facing competitive landscapes experiencing dynamic technological transformation. Empirical research will have to determine whether the horizontal organizational form is fad or substance, and the extent to which learning systems make it work.

The propositions suggest new ways to empirically test organizational learning concepts. Previous work in this area has been largely theoretical or based on simulation. A difficulty in researching organizational learning is measuring the process and in measuring the outcome. By tying organizational learning directly into communications, researchers may use previously-developed measures of communication process as proxies for organizational learning-related variables of interest. For example, retrieval of knowledge from organizational memory and learning from the experience of others (Levitt & March, 1988) might be proxied by communication measures such as message routing and summarizing, by characteristics and dimensions of the kinds of communication channels used, or by content analysis of communications. The extent to which an organization develops as a learning

organization might be measured by positive changes in communication network characteristics of the organization (Knoke & Kuklinski, 1982; Monge & Contractor, 1988; Rice & Richards, 1985).

Furthermore, the suggestion that learning outcomes may be gauged by changes in organizational knowledge and in resources or capabilities may provide insight for measurement in future empirical work. West (1995) implies that organizational knowledge may be conceptually similar to underlying consensus among managers regarding ways of conducting business strategically. This is because consensus—like useful knowledge—is socially constructed, dynamic and emergent, and highly dependent on the constellation of individuals involved and context in which it is sought. As such, it represents a means through which to integrate individual perspectives into an organizational view, a challenge which has confronted organizational learning theorists up till now (Levitt & March, 1988; Lundberg, 1995; Rahim, 1995). Thus more sophisticated measures of management consensus may hold promise for detecting the state of an organization's knowledge and changes in its knowledge structure over time, and consequently the effectiveness of organizational communications and the degree of organizational learning.

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