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**Organizational learning and competitive advantage: A
theoretical and empirical analysis**

Dimovski, Vlado, D.B.A.

Cleveland State University, 1994

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ORGANIZATIONAL LEARNING AND COMPETITIVE ADVANTAGE:
A THEORETICAL AND EMPIRICAL ANALYSIS

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DEDICATION

This dissertation is dedicated to my father, Dušan,
and to Vinko, both deceased during my doctoral studies.

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A doctoral dissertation is like a puzzle: not a single piece is redundant and a dissertation is completed only when all pieces are put together. The author wants to express his gratitude to all that participated in putting this dissertation puzzle together.

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ABSTRACT

ORGANIZATIONAL LEARNING AND COMPETITIVE ADVANTAGE: A THEORETICAL AND EMPIRICAL ANALYSIS

by

VLADO DIMOVSKI

Chairman: Bernard C. Reimann

Recent developments in the strategic management area have suggested the importance of organizational learning for organizational performance and competitive advantage, yet most of the previous studies of organizational learning have either lacked conceptual integration or strategic focus.

Using one-industry research design and stratified sample of 200 credit unions in Ohio based on the asset size criterion, this study investigated the determinants, process, and outcomes of organizational learning, as well as the relationship between organizational learning and performance.

Empirical testing via regression analysis provides support for the relationships between strategic intent and the organizational learning process (reflecting non-industry specific information acquisition, industry specific information acquisition, and media richness), and between organizational openness and the organizational learning process. The hypothesized relationship between environmental turbulence and the organizational learning process is not supported. The relationships between joint effects of external and internal factors and the organizational learning

process are only partially supported. The same is true for the relationship between the organizational learning process and organizational learning outcomes (reflecting behavioral and cognitive changes). Finally, empirical testing provides support for a significant relationship between organizational learning outcomes and organizational performance, thus suggesting that organizational learning might be a source of competitive advantage in the credit union industry.

The conclusions of the study suggest: first, perceived environmental turbulence leads to the information overload caused by the lack of information processing capacities of credit unions. Second, the positive effects of strategic intent and organizational openness on the organizational learning process suggest that organizations with strategic focus and higher flexibility have a higher probability of acquiring and interpreting the information. Third, the organizational learning process in credit unions includes more second-hand than direct learning, primarily due to the high capital requirements of direct learning. Fourth, behavioral changes are more likely to occur than cognitive changes as the outcomes of organizational learning process. Fifth, the positive relationship between behavioral/cognitive changes and performance suggests that credit unions share the characteristics of "learning organizations" and that organizational learning can be considered as an important "isolating mechanism" of gaining competitive advantage.

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CHAPTER I

INTRODUCTION

Recently organizational learning has emerged as one of the central and most important concepts in the strategic management literature (Garvin, 1993; Lyles, 1990; Ramanujam, 1993; Senge, 1990). De Geus (1988, p.71) states that "The ability to learn faster than your competitors may be the only sustainable competitive advantage."

Organizational learning has been a key assumption in organizational and management theory for the last forty years but rarely made explicit (Daft & Huber, 1987). Most of the attempts to conceptualize organizational learning have either lacked conceptual integration (Shrivastava, 1983), had little regard for broad theoretical bases (Crossan, 1991; Huber, 1991) or have failed to clearly define the concept of organizational learning (Garvin, 1993).

Fiol and Lyles (1985) report the existing theoretical confusion due to the use of different terms and concepts of organizational learning. The most often used terms for organizational learning are (a) new insights or knowledge (Argyris & Schon, 1978), (b) new structure (Chandler, 1962),

(c) new systems (Jelinek, 1979; Miles, 1982), and (d) organizational actions (Cyert & March, 1963; Miller & Friesen, 1980). The most often used concepts related to organizational learning are adaptation (Meyer, 1982), change (Dutton & Duncan, 1983), and unlearning (Starbuck, Greve, & Hedberg, 1978).

Despite its importance for strategic management, organizational learning is yet to be conceptualized. Also, strategic theoreticians need yet to explore the processes related to organizational learning which are instrumental for effective organizational performance and competitive advantage. A general conclusion from the existing literature on organizational learning is that efforts to conceptualize organizational learning from a strategic perspective are somewhat diffused and need to be integrated.

Research Questions

The purpose of this dissertation is three-fold: first, to explore the factors that induce organizational learning; second, to develop an integrative model of organizational learning; and third, to explore the processes related to organizational learning that can induce competitive advantage. The contribution of the dissertation to the field of management is to develop an integrative framework for diverse approaches to organizational learning, to enhance the understanding of different aspects of organizational learning

and their interconnectedness, and to specify the role of organizational learning as a source of effective organizational performance and competitive advantage.

Specifically, the dissertation addresses two research questions:

1. What factors are conducive to organizational learning?
2. What processes of organizational learning are conducive to effective organizational performance and (sustained) competitive advantage?

The first research question addresses the determinants of organizational learning. The second research question addresses the types and characteristics of organizational learning, processes related to organizational learning, the strategic importance of organizational learning, and the extent to which organizational learning can confer durable competitive advantage.

Theoretical Basis

In the context of this investigation, organizational learning is rooted in two theoretical bases: (a) the theory of organization as institutionalized brains (Morgan, 1986), and (b) the principles of cybernetics (Ashby, 1956; von Bertalanffy, 1968; Wiener, 1961).

The theory of organization as institutionalized brains provides "a means of accounting for differences between

mechanistic and more organic forms of organization. While the former are based on information and decision-making systems that are highly programmed and preplanned, the latter are typically based on processes which are more flexible and ad hoc" (Morgan, 1986, p.82). This theory revolves around the idea that it is possible to design organizations that can learn and self-organize in the manner of functioning brains. The strength of such an approach is exploring the contribution to the understanding of organizational learning and capacities for self-organization. In fact, this theory suggests that it is imperative for an innovative organization designed as a learning system to emphasize information acquisition and information interpretation. This theory also enables the researchers to investigate organizational processes beyond the bounded rationality (Simon, 1991) that characterizes many other approaches.

Principles of cybernetics that are pertinent to organizational learning are the following: first, systems must have capabilities to sense, monitor, and scan significant aspects of the environment; second, they must translate the information from the environment to the operating procedures, processes and norms that guide system behavior; third, they must be able to detect deviations from expected behavior; and fourth, they must be able to initiate action to correct the deviations (Morgan, 1986; von Bertalanffy, 1968; Wiener, 1961).

CHAPTER II

ORGANIZATIONAL LEARNING: DEFINITIONS, AND CLASSIFICATIONS

Extensive research on organizational learning has been fragmentary and multidisciplinary (Shrivastava, 1983) and has produced numerous definitions that differ in the levels of inclusiveness, breadth, and focus.

Shrivastava (1983) defines organizational learning as comprising four different modes: (a) adaptation, (b) shared assumptions, (c) knowledge-development of action-outcome relationship, and (d) institutionalized experience. Adaptation is an incremental process of identifying environmental changes, adapting to them and successfully coping with them. Shared assumptions are a basis for organizational theories-in-use which are changed by organizational learning. Knowledge-development is a continuous process by which knowledge about action-outcome relationships and the effects of the environment on these relationships is developed (Duncan & Weiss, 1978; Dutton & Duncan, 1981). Institutionalized experience is an accumulation of efficiencies through experience and tradition

and is described by an experience curve (Abernathy & Wayne, 1974; Yelle, 1979).

Levitt and March (1988) focus on characteristics of organizational learning. They define organizational learning as routine-based, history-dependent, and target-oriented. Organizations learn through repeating the same routine, thus increasing organizational efficiency and reducing costs of production (Porter, 1985). The sources of learning are direct experience, the experience of other organizations, and interpretations of such experiences. Target-orientation eliminates unnecessary practices and routines, thus, increasing organizational efficiency and productivity (Teece, Pisano, & Shuen, 1990).

Daft and Huber (1987) realize that organizational learning is a complex and multidimensional phenomenon. They classify it into system-structural and interpretive perspectives. The system-structural perspective of organizational learning stems from a broader system-structural view of organizations (Astley & Van de Ven, 1983) and the interpretive perspective explores deeper processes (primarily interpretation of information) that underlie surface structure.

Fiol and Lyles (1985) distilled different approaches to organizational learning into a synthetic definition as "the development of insights, knowledge, and associations between past actions, the effectiveness of those actions, and future

actions" (Fiol & Lyles, 1985, p.811). Organizational learning differs from adaptation which is merely "the ability to make incremental adjustments as a result of environmental changes, goal structure changes, or other changes" (Fiol & Lyles, 1985, p.811).

Garvin (1993, p.80) defines organizational learning in terms of learning organization as "an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights."

Most of the discussed definitions are partial and define organizational learning only from a certain theoretical perspective. Only a summary of different definitions of organizational learning that is broad (includes different types of organizational learning), inclusive (includes different processes related to organizational learning), and strategically focused can be used for a strategic management research purpose. The summary of definitions of organizational learning as given in the next paragraph includes determinants of organizational learning, the process of organizational learning, and outcomes of organizational learning.

Organizational learning is triggered by changes in the environment that force an organization to effectively adjust to its environment (Duncan & Weiss, 1978; Dutton & Duncan, 1981; Fiol & Lyles, 1985) or by organizational intent to perform better than its competitors (Hamel & Prahalad, 1989;

Hrebiniak & Joyce, 1985). The process of organizational learning includes various types of learning that encompass acquisition, distribution, and interpretation of information within an organization (Huber, 1991). Organizational learning produces new insights and informational meanings (Daft & Huber, 1987); generates behavioral organizational changes (Argyris & Schon, 1978); reveals the associations between past actions and future actions (Fiol & Lyles, 1985; Levitt & March, 1988; Teece, Pisano, & Shuen, 1990); enhances the effectiveness of organizational performance (Teece, Pisano, & Shuen, 1990); and potentially generates (sustained) competitive advantage (Nelson & Winter, 1982; Porter, 1985; Senge, 1990).

Such a description of organizational learning implies an alternative classification of organizational learning. The cybernetics principles and "brain" theory can be used to organize different approaches of organizational learning into four perspectives: informational, which deals with the information acquisition processes; interpretive, which deals with the development of new insights based on information; behavioral, which addresses the action that is based on the information and new insights; and the strategic management perspective, which deals with causes and strategic outcomes of organizational learning. Each of the four perspectives includes different types and different related processes that contribute to organizational learning. The types of

organizational learning and related processes are summarized in Table 1 and will be fully addressed in the next chapter.

Most of the existing literature can be classified into the first three perspectives of organizational learning. These perspectives all underpin our first research question (i.e. factors conducive for organizational learning). The behavioral and strategic management perspectives provide a basis for our second research question (i.e. can organizational learning be a source of competitive advantage?).

In the literature review section, the synthesis of the existing literature on the four perspectives as well as the development of a conceptual framework of organizational learning will be discussed.

CHAPTER III

LITERATURE REVIEW

This literature review is organized into four sections analyzing each of the four perspectives on organizational learning: (a) informational, (b) interpretive, (c) behavioral, and (d) strategic management. Each of these perspectives tackles the types of organizational learning and most significant processes related to organizational learning (see Table 1).

Table 1

Organizational Learning Perspectives, Related Processes, and Types of Organizational Learning

Perspective	Related processes	Type of organizational learning
Informational	Information acquisition	Congenital Direct -experience -trial-and-error Second-hand -corporate intelligence -benchmarking -grafting
Interpretive	Information distribution Organizational memory Information characteristics -equivocality -load -value Framing Media richness	
Behavioral	Cognition-behavior fit	No learning Forced Experimental Surface Blocked Reinforced Anticipatory Integrative Role-constraint Superstitious Audience Experiential Unlearning Parenthetic Single-loop Double-loop Deutero Experimentation Systems thinking Personal mastery Mental models Shared vision Planning and learning laboratories
	Organizational learning cycle	
	Error detection and correction (Action learning)	
	Processes in learning organizations	
Strategic	Causes/stimuli of organizational learning Competitive advantage of organizational learning	

Informational Perspective

This perspective describes the flow of information within an organization, including the processes of information acquisition, information distribution, and organization memory (information storage and retention) (Laudon & Laudon, 1988). The implicit assumption of this perspective is that each individual in an organization has a mental map of the world which is a copy of the world one encounters (Crossan, 1991). This implies that information does not differ from data and that different individuals have an unbiased interpretation of the objective reality. Also, managers do not focus on the interpretation of information, but rather on the process of obtaining the right information (Crossan, 1991).

Organizational learning occurs when one or more organizational subunits obtain information and recognize it as potentially useful (Huber, 1991). The purpose of organizational learning is reduction of uncertainty or ignorance by providing the right data (Daft & Huber, 1987).

Information Acquisition

An organization acquires information through four different types of organizational learning: congenital learning, direct learning, second-hand learning, and grafting (Daft & Huber, 1987; Feldman & March, 1981; Hedberg, 1982; Nonaka & Johansson, 1985; Sabaitier, 1978; Shukla, 1982; Spekman, 1979; Wilensky, 1967).

Congenital Learning

Organizations are not founded in a sociological or economic vacuum. Their founders or creators at the time of the organization's birth, possess a certain level of knowledge about environment and the organization's prospective processes (Boeker, 1988, 1989; Kimberly, 1979; Schein, 1984; Stinchcombe, 1965). Inherited knowledge that is passed onto a new organization consists of institutional knowledge and context specific knowledge (Daft, 1991; Meyer & Rowan, 1977). Once the potential founders of a new organization make a decision and before the new organization is actually created there is a certain period of time during which founders seek additional knowledge through various activities and forms of learning (Daft, 1991).

Direct Learning

Direct learning is the most prevalent type of learning in organizations. Although very insightful, the literature on direct learning contains very few systematic studies beside the experience curve approach and shows no cumulative effect (Huber, 1991). Direct learning occurs through four different manners: experience, internal benchmarking, trial-and-error learning, and organizational experimentation (Argote, Beckman, & Epple, 1990; Arrow, 1962; Herriott, Levinthal, & March, 1985; Huber, 1991; Levitt & March, 1988; Yelle, 1979).

Experience. Experience as a type of organizational learning was conceptualized as a learning curve (Alchian, 1963; Asher, 1956; Carlsson, 1961; Lieberman, 1989; Pattison & Teplitz, 1989; Wright, 1936). A learning curve is defined as a function that relates the unit costs of individual firm with accumulated volume (Spence, 1981; Yelle, 1979).

The basic assumption of the learning curve is that learning is the product of increasing experience at different organizational levels (Arrow, 1962; Dutton & Thomas, 1984). When a new product is introduced, the cost per unit at plant level is initially high, but as cumulative output increases, the cost per unit falls in a predictable way (Hall & Howell, 1985) and the production time per unit decreases (Alberts, 1989; Argote, Beckman, & Epple, 1990).

Empirical investigations (Levitt & March, 1988) show the intention to find underlying causes of the experience curve (BCG, 1972), to employ the experience curve for organizational strategies (Ghemawat, 1985), and to predict cost-volume relations (Muth, 1986; Yelle, 1979).

Internal benchmarking. "Benchmarking is the search for industry's best practices that lead to superior performance" (Camp, 1989, p.12), as well as the practices of the observed organization itself. Most of the authors distinguish between some type of internal benchmarking and external benchmarking (Balm, 1992; Camp, 1989; Liebfried & McNair, 1992; Miller, De Meyer, & Nakane, 1992; Watson, 1993).

Internal benchmarking is conducted against internal operations of the organizations in different operating units or divisions. An organization can benchmark functions, operations, or practices in one part of the organization and successfully use them in its other parts. Internal benchmarking is the cheapest type of benchmarking and is usually the first step in a process of benchmarking. In addition, internal benchmarking can help to define the scope of external benchmarking or it may even define an internal operation which is benchmarked (Camp, 1989).

Internal benchmarking has four process steps (Camp, 1989): (a) planning, which includes identification of benchmarking objects; (b) analysis, which includes determination of performance gaps; (c) integration, which includes communication of benchmarking findings; and (d) action, which consists of development of action plans. An outcome of the benchmarking process should lead to a superior competitive position and to a full integration of practices into organizational processes.

Trial-and-error learning. Trial-and-error learning occurs when an organization gradually adopts routines and procedures which eventually lead to favorable outcomes (Levitt & March, 1988). Such learning occurs within a given organizational structure and a given set of rules. Thus, routines which are perfected are treated, fixed, and, within the observed period, unchangeable

The outcome of trial-and-error learning is increased specialization which can lead to lower costs per unit and higher efficiency of production (Burgelman, 1988; March, 1981). Specialization, however, can also lead to an unfavorable outcome or competency traps (Cooper & Schendel, 1976; Levitt & March, 1988; Zucker, 1977). Competency traps occur when organizations achieve a favorable performance through an inferior procedure. Such a situation leads organizations to accumulate even more experience with such a procedure and neglect the adoption of new procedures (Barley, 1988). This is especially unfavorable when organizations learn fast (Herriott, Levinthal, & March, 1985).

Second-Hand Learning

An organization can capture the experiences of other organizations through the transfer of encoded experience about technologies, routines, practices, and products (Camp, 1989; Dutton & Starbuck, 1978) through corporate intelligence, through external benchmarking, and through grafting.

Corporate intelligence. The corporate intelligence process transforms disaggregated data which is of interest to management into relevant, accurate, and usable knowledge about competitors' different capabilities and intentions (Fuld, 1988; Gilad & Gilad, 1988; Greene, 1966; Sammon, Kurlan, & Spitalnic, 1984). The intelligence process produces a valuable environmental information but should never be the

only source. Rather, information should be subjected to interpretation by the decision-maker for whom it is developed so that the role of intelligence is not determinative but rather supplemental (Sammon et al., 1984).

Corporate intelligence can be informal and formal (Gilad & Gilad, 1988). Informal intelligence is not expensive, does not require special attention, is not coordinated, and has no special focus of attention. Formal corporate intelligence, on the other hand, is a highly structured process using an intelligence cycle (Eels & Nehemkis, 1984; Sammon et al., 1984), a detailed intelligence system (Porter, 1980), and an intelligence-gathering pyramid (Fuld, 1985).

External benchmarking. External benchmarking consist of three types: (a) competitive benchmarking, (b) functional benchmarking, and (c) generic benchmarking.

Competitive benchmarking occurs when organizations benchmark against competitors' products or product attributes. Such benchmarking must specify the comparative advantages and disadvantages of the competitor. Functional benchmarking is broader than competitive benchmarking in its scope, for it focuses not only on a direct product competitor but also on different functions of competitors in different industries. Generic benchmarking is the most general among different types of benchmarking. It focuses on business functions or processes regardless of the industry. Generic benchmarking

can uncover practices and methods that might not be familiar to the investigator's own industry (Camp, 1989).

Grafting. Grafting is a process of acquiring knowledge through acquiring new members who possess knowledge previously not available to the organization (Huber, 1991). Grafting can emerge through three various forms: (a) employing new members with specific knowledge; (b) company acquisition; through joint venture; and (c) strategic alliances.

Employing new members is a very common practice of acquiring new and specific knowledge. An organization continuously spots potential employees through its monitoring systems. Once there is a need for specific knowledge possessed by certain individuals, the organization tries to attract them into its work force.

Grafting through company acquisition occurs when an acquiring organization inherits the complementary organizational knowledge of an acquired organization (Huber, 1991).

Grafting through joint ventures is expected to increase as an organization's assimilation of new knowledge will continue to increase (Jemison & Sitkin, 1986; Kogut, 1988; Lyles, 1988). Grafting through joint ventures occurs due to permeability of the organization's boundaries as a way of transferring tacit knowledge among organizations when organizations seek to retain or increase their capabilities (Kogut, 1988; Spender, 1993).

Grafting through strategic alliances (interpartner learning) considers organizational learning and knowledge creation as central objectives of strategic alliances (Badaracco, 1991; Hamel, 1991; Pucik, 1988; Ready, 1992). Strategic alliances can help one company to learn specialized capabilities from the other or can help a company to combine its special capabilities with those of another company in order to build up its skills and capabilities so that both partners would benefit from it.

Information Distribution

Voluminous literature exists on information distribution in organizations (Farace & McDonald, 1974; Huber, 1982, 1991; Krone, Jablin, & Putnam, 1987; Porter & Roberts, 1976; Thayer, 1967). Organizations distribute information in order to carry out particular functions or activities, or when they assume that organizational members should learn or behave differently (Daft & Huber, 1987).

Information is distributed across organizational subunits through a pattern of diffusion (DiMaggio & Powell, 1983; Imai, Nonaka, & Takeuchi, 1985; Kimberly, 1981; Levitt & March, 1988; Rogers & Schoemaker, 1971) using message routing and message summarizing (Daft & Huber, 1991). Message routing is the distribution of any particular information to relatively few organizational units. Message summarizing reduces the size of a message while simultaneously and

faithfully reproducing its meaning (Daft & Huber, 1987). Message summarizing includes various techniques of summarizing, reporting, and communicating. Both processes decrease the information load and increase the efficiency of its processing.

Information distribution has three implications for organizational learning: first, it increases the speed of organizational learning through message routing and message summarizing; second, it enhances learning of individuals, organizational units and the organization as a whole due to numerous sources of information involved; and third, it increases the amount of organizational knowledge in those cases when the organization does not know what information it actually has until different pieces of information are collected in a "central storage" (Huber, 1991).

Organizational Memory

Organizations store a variety of information in organizational memory (Burrell & Morgan, 1979; Daft & Weick, 1984; Walsh & Ungar, 1991) about rules, procedures, technologies, beliefs, and cultures they learn or adopt through processes of socialization and control (Levitt & March, 1988), standard of dress, protocol, and furniture arrangements (Argyris & Schon, 1978; Cyert & March, 1963; Simon, 1976; Smith & Steadman, 1981). Organizational memory has two structural parts: (a) storage and retention of

information, and (b) retrieval of information (Huber, 1991; Levitt & March, 1988; Walsh & Ungar, 1991).

Information that is stored in organizational memory can be divided by its nature into "soft" and "hard" information (Huber, 1991). "Hard" information consists of inferences drawn from experiences which are recorded on documents, accounts, files, standard operating procedures, routines, and scripts (Levitt & March, 1988). "Soft" information encompasses information stored only mentally by organizational members (Mintzberg, 1975) and represents tacit organizational knowledge (Polanyi, 1967).

Information is stored and retained via retention facilities: individuals (Nystrom & Starbuck, 1984; Walsh & Ungson, 1991), organizational culture (Deal & Kennedy, 1982; Smircich, 1983; Wiener, 1988), transformations (Van Maanen & Schein, 1979), structures, ecology (Sommer, 1969; Walsh & Ungson, 1991), and external archives (Porter, 1980; Neustadt & May, 1986; Walsh & Ungson, 1991).

Retrieval of information depends on the availability of information stored (Levitt & March, 1988) and the level of retrieval (Walsh & Ungson, 1991). The availability of information is associated with frequency of use of particular information, and with the costs involved in finding and using stored information in organizational memory (Argote et al., 1987). There are two levels of retrieval: individuals in

organizations, and the entire organization (Walsh & Ungson, 1991).

Retrieval of information can be automatic or controlled (Kahneman, 1973). Automatic retrieval does not involve any specific action or effort to retrieve the information but is merely done through some well-established or habitual sequences of action on the individual or organizational level. Controlled retrieval of information involves controlled efforts to retrieve stored information (Neustadt & May, 1986). Controlled retrieval is usually done when organizations dismantle or redesign technology, structure, or ecology.

Interpretive Perspective

Interpretation is defined as a process of translating events and developing shared understanding and conceptual schemes among members of an organization, or more generally, as a process through which an item of information is given a meaning (Daft & Huber, 1987; Daft & Macintosh, 1981; Daft & Weick, 1984).

Interpretation of information is a crucial part of organizational learning because managers have, sometimes, the right information but fail to interpret it correctly (Crossan, 1991; Hildebrand, 1989). The interpretive perspective deals with three distinctive concepts related to information interpretation: information interpretation characteristics (equivocality, load, and value), the means of information

interpretation (framing), and the media through which information is transmitted.

Information Equivocality, Load, and Value

Information sometimes might be equivocal and can, thus, have several possible interpretations (Daft & Huber, 1987; Daft & Macintosh, 1981). Organizational learning appears through reducing the equivocality of information to an acceptable level. The level of acceptability depends primarily on the purpose of information.

Information load is defined as the volume of information inputs required for an organization to perform its tasks (Farace, Monge, & Russell, 1977). There are two phenomena related to information load which decrease both the accuracy and the effectiveness of interpretation: information overload and information underload. Information overload occurs when information exceeds the organization's information processing (Huber, 1991; Meier, 1963). In contrast, information underload occurs when there is an excess of capacities for interpreting information. The latter phenomenon has not yet been analyzed in the literature.

The interpretation of information is also related to information value whenever an organization behaves as an economic agent (Cherry, 1966; King, 1980; Trauth, 1978). The value of information increases whenever the information interpretation reduces uncertainty (Shannon & Weaver, 1973),

increases managers' focus on particular information (Rockart, 1979), and helps members in organizations to focus more on information effectiveness rather than its efficiency (Meyer & Boone, 1987; Porter & Millar, 1985; Taylor, 1986).

Framing

Framing refers to the differences in the presentation of information (Dutton & Jackson, 1987; Kahneman & Tversky, 1979; Tversky & Kahneman, 1981). Framing can affect information interpretation if information for various reasons has not been framed uniformly across different organization units (Huber, 1991). Individuals are prone to be risk-averse when information is positively framed and risk-seeking when information is negatively framed (Bazerman, 1984; Kahneman & Tversky, 1979). Positive or negative framing depends on the reference point (Puto, 1987).

Recent developments on framing integrate framing and the concept of time into the time-outcome-valuation (TOV) model (Loewenstein, 1988; Mowen & Mowen, 1991). The integration of framing and time is of crucial importance to organizational learning because organizational learning is by definition a process that occurs only in a period of time. The TOV model combines framing dimensions (gain and loss) with time dimensions (current and future time) into four different combinations: risk aversion (gain now, loss now) (Puto, 1987; Qualls & Puto, 1989), future optimism (gain in future, loss

in future) (Jones & Johnson, 1977; Wright & Weitz, 1977), individual trap or speed-up costs (gain now, loss in future) (Loewenstein, 1988; Platt, 1973), and finally, individual fence or delay charge effects (loss now, gain in future) (Mowen & Mowen, 1991; Selto & Clouse, 1985).

Media Richness

Organizations convey information through various channels which differ in their capacity for facilitating understanding (Daft & Huber, 1987). The capacity of channels to change mental representations within a specific time interval is referred to as media richness (Daft & Huber, 1991; Daft & Lengel, 1984; Lengel, 1983).

Media richness depends on four different characteristics: first, the use of feedback, second, the number of channels, third, the level of tailoring of information to personal circumstances, and finally, the type of the language used. According to the previous four characteristics, media can be low or high in richness. For example, personal communication is high in richness because it has immediate feedback, has multiple channels, is very personal in tailoring information, and uses natural language (Daft & Wiginton, 1979).

The level of media richness is important for media selection as media selection is closely linked with organizational learning in terms of reducing information

equivocality. Accurate media selection can substantially reduce information equivocality (Daft & Lengel, 1984). Generally, in an environment with high information equivocality media that is high in richness is preferred (Kreps, 1980; Randolph, 1978), while in an environment with low information equivocality less rich media is used (Weinshall, 1979).

Behavioral Perspective

The behavioral perspective is based on the assumption that organizational learning leads to change in organizational behavior (Argyris & Schon, 1978; Crossan, 1991; Fiol & Lyles, 1985). The enormous body of literature on the behavioral perspective can be synthesized into four distinctive approaches: cognition-behavior fit, cycle of choice, action learning, and learning organization.

Cognition-Behavior Fit Approach

Cognition and behavior relationship depends on vicarious learning and organizational schema/script (Crossan, 1991; Gioia & Manz, 1985). Learning vicariously, organizations use organizational schema/scripts as the guides for output of purposeful behavior (Lord & Kernan, 1987).

Vicarious learning is based on social learning theory (Bandura, 1977; Kraut, 1976; Manz & Sims, 1981; Smith, 1976) and refers to "symbolic processes as opposed to direct

experience: An observer learns from behavior and consequences experienced by model rather than from outcomes stemming from his or her own performance attempts" (Gioia & Manz, 1985, p. 528).

Organization members retain schema-based knowledge of behavior and behavior sequences for specific situations or contexts. More specifically, schema provides a knowledge-based structure that serves as a guide for the interpretation of information, actions, and expectations (Gioia & Poole, 1984; Graesser, Woll, Kowalski, & Smith, 1980). In addition, schema plays a significant role in enacting particular behavior (Langer, 1978; Lord & Smith, 1983) and makes sense of social and organizational information and situations (Gioia & Manz, 1985).

Some examples of organizational schemata are stereotypes (Hamilton, 1979), ideal models or prototypes (Cantor & Mischel, 1979), casual schemata (Kelley, 1973), frames (Minsky, 1975), and implicit theory (Schneider, 1973). As Gioia and Manz (1985) point out most of these organizational schemata that play roles of cognitive frameworks for understanding a particular behavior are used for categorizing and interrelating information. However, these frameworks are not considered to be guides for a particular behavior, since they are static in their nature.

More dynamic schemata which organizations use as guides

for behaviors in particular specific situations and contexts are called organizational scripts.

The organizational script is defined as a procedural knowledge structure or schema held in memory for interpreting, understanding, and enacting behavior appropriate for a particular context (Abelson, 1981; Gioia & Manz, 1985; Gioia & Poole, 1984; Langer, 1978). Script processing is the performance of the behaviors or events contained in the existing structure of knowledge (Gioia & Poole, 1984).

There are two benefits of organizational scripts for the members of organizations: they enable understanding of situations, and they provide a guide to behavior appropriate to those situations. Scripts are held in memory as ideal patterns of behavior or prototypes.

The relationship between vicarious learning and organizational script can be either descriptive or prescriptive (Gioia & Manz, 1985). A descriptive relationship considers scripts as a core of vicarious learning since a model enacts scripts for a particular behavior of the organization. A prescriptive relationship considers scripts as an ideal behavioral outcome. Both relationships pass through different phases of development -attention, retention, and motor reproduction - linking organizational learning and script (Bandura, 1977).

The relationship between organizational learning and

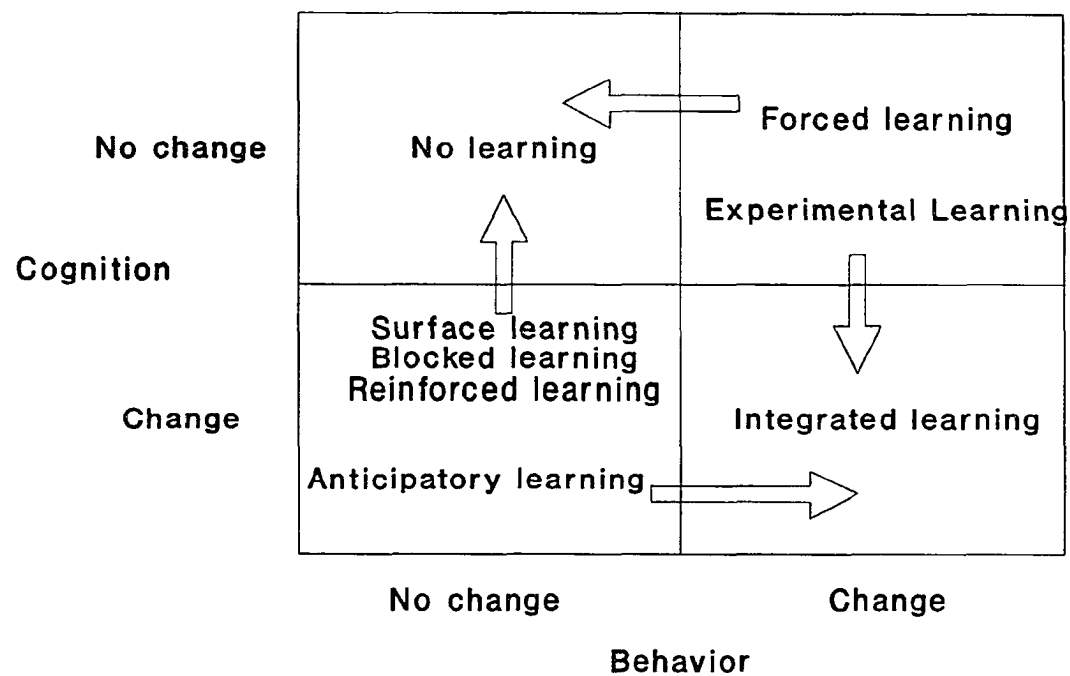
behavioral and cognitive change has three major explanations: first, organizational learning encompasses organizational cognition (Fiol & Lyles, 1985); second, organizational learning encompasses only behavioral change (Daft & Weick, 1984); and finally, organizational learning might imply changes in behavior and changes in cognition (Crossan, 1991).

Based on the three explanations of the relationship between organizational learning and behavioral and cognitive changes, a typology of organizational learning can be introduced (Crossan, 1991). Behavioral and cognitive change each have two dimensions (no change or change), thus creating four possible combinations (see Figure 1).

No change in behavior or cognition implies no learning, therefore suggesting that for organizational learning to occur there has to be a change of one or both types.

Change in behavior without a change in cognition is a result of forced learning and experimental learning. Forced learning occurs when individuals employ their current beliefs to change behavior. Experimental learning occurs when individuals try new behaviors that may result in behavioral change.

Figure 1. Relationship between cognition and behavior



Source: Crossan (1991, p.13)

No change in behavior with change in cognition is a result of four possible types of learning: surface learning, blocked learning, reinforced learning, and anticipatory learning. Surface learning occurs when individuals change their cognition in order to accept what they should believe. Blocked learning occurs when beliefs override the situation, causing difficulty in distinguishing it from surface learning. Reinforced learning occurs when individuals' beliefs change as a result of existing specific behavior patterns or other relationships that support current behaviors. Anticipatory learning expresses a time lag between individuals' experience of behavioral and cognitive change.

Change in behavior and change in cognition are the result of integrated learning which might be the only learning that can be a source of competitive advantage (Crossan, 1991; De Geus, 1988).

Organizational Learning Cycle Approach

The organizational learning cycle has four distinguishable phases: individual action, organizational action, environmental action or response, and individuals' beliefs or their cognitions which are connected into a circle. The organizational learning cycle approach understands organizational learning as "how organizations continue to learn as they travel through different environments" (Hedberg,

1981) and is based on a stimulus-response framework (March & Olsen, 1975).

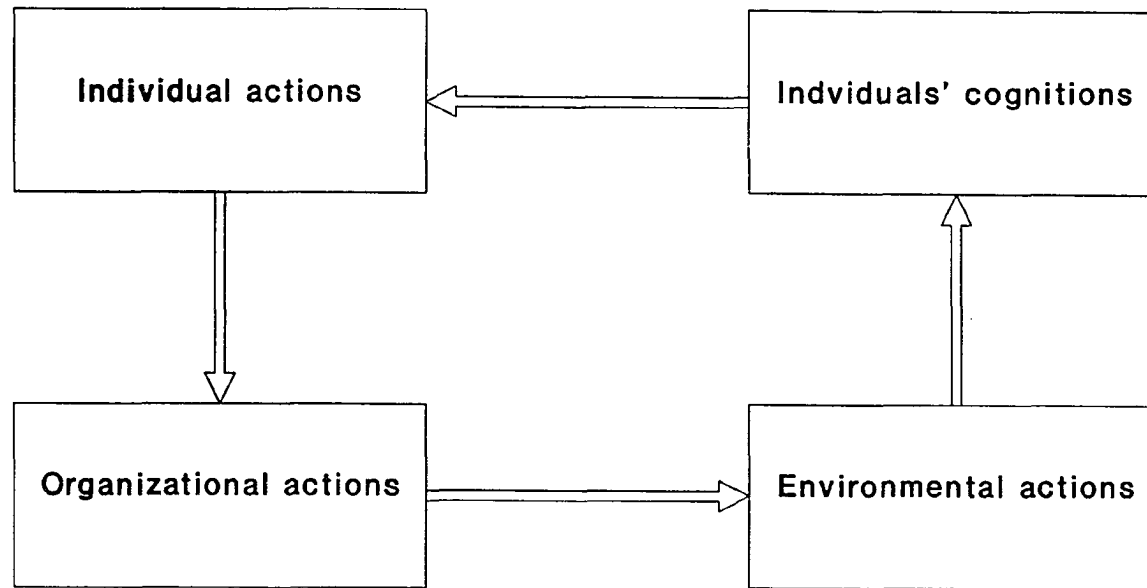
This concept is based on the assumption that an organization can learn only through its individuals and organizational learning is simply a cumulation of individual learning (Crossan, 1991; Hedberg, 1981). Whenever organizations know less than their individual members, there are problems in communication (Hedberg, 1981).

Environments change frequently and are not merely given to the organization. Rather, organizations blend adaptive and prospective enactment through selecting and activating their environments for defensive and offensive purposes.

A stimulus-response framework is widely used in analyzing individual learning, where it is usually assumed that a stimulus precedes, or triggers, a response. In the learning cycle approach, organizations can select their environment and respond to stimuli in that particular environment.

When the phases of organizational learning are thoroughly connected in the order I have discussed above, then the learning cycle is complete (see Figure 2). If the cycle is broken, it is then incomplete and many interesting phenomena important for organizational learning occur (March & Olsen, 1975).

Figure 2. Organizational learning cycle



Source: March & Olsen (1975)

When the cycle is broken between individual beliefs (or their cognitions) and organizational action, then individual learning has little or no effect on individual behavior. The cycle is broken by constraints of role-definition and standard operating procedures and the learning that occurs is called role-constrained learning.

When the cycle is broken between organizational action and environmental response, then individuals within an organization take action, but organizational action does not "enact" environment significantly (Weick, 1979). The learning that occurs is called superstitious learning (Levitt & March, 1988; March & Olsen, 1975).

When the cycle is broken between individual action and organizational action, then individual behavior no longer affects organizational action or its behaviors. The learning that occurs is called audience experiential learning.

The final example of an incomplete cycle occurs when the learning cycle is broken between environmental response and individual beliefs. Organizations learn under the condition of ambiguity, which means that environmental response does not affect individual beliefs in the organization.

Unlearning

Unlearning is a process that discards knowledge, changes mental maps, and implies new organizational responses (Hedberg, 1981; Huber, 1991; Klein, 1989; Nystrom & Starbuck,

1984). Unlearning is based on the stimulus-response framework and primarily depends on the type of environment and the success of previous behavior. Previous success reinforces organizations' behaviors and makes unlearning more difficult. Also, when organizations move from stable environments to more unstable or even turbulent ones unlearning becomes difficult (Hedberg, Nystrom, & Starbuck, 1976; Hedberg, 1981).

Unlearning can be typified into four models: the extinction model, the replacement model, the exorcism model, and the salvation model (Klein, 1989).

The extinction model represents the removal of undesirable knowledge from individuals and elimination of particular behavior through the explicit dissuasion which occurs in the organization. The replacement model represents the dissemination of new knowledge to individuals. According to this model new behavior is learned through its recommendation as an alternative to existing behavior. Such a model has serious limitations due to its failure to accommodate learning of which individuals are capable and behaviors through which learning is achieved. The exorcism model represents the removal of inappropriately-behaving individuals from the organization, which has similar effects as in the extinction model. The salvation model represents replacement of inappropriately-behaving individuals by a mythical manager-savior who will lead the organization into prosperity.

Parenthetic Learning

Related to unlearning is parenthetic learning which is defined as "the cognitive expulsion of elements from a set, due to enhanced understanding of characteristics that define the set" (Klein, 1989, p.300). The elements that can be pieces of information in the set are distinguished from the previous elements and are "parenthesized." The simple implication of parenthetic learning is that organization can achieve the same effectiveness of learning with fewer pieces of information.

Parenthetic learning is also based on the stimulus-response framework but, in contrast to unlearning, includes also the organizational information processing capabilities (Klein, 1989). Parenthetic learning occurs when a response is appropriate in a particular context and when the same type of response is inappropriate in a different context. Parenthetic learning, thus, has an enormous impact on an organization's adaptability.

Action Learning Approach

The action learning theory of Argyris and Schon (1978) is probably one of the most cited organizational learning theories. This approach states that human action underlies two theories that represent human behavior: theories-in-use and theories of action (Argyris, 1974; Argyris & Schon, 1974).

Theories-in-use reflect people's actual behavior and assume only single-loop learning and organizational experimentation. Theories of action are based on three organizational behavior principles: the requisite variety, the ability to learn how to learn, and the principle of minimum critical specification. (Morgan & Ramirez, 1983). The latter theories use people's reports as a basis of their action and assume that organizations can learn through double-loop learning and deuterio learning (Argyris, 1976).

Organizational learning within the action learning approach is generally defined as involvement in the detection of errors and their correction (Argyris & Schon, 1978; Dery, 1982). More specifically, it can refer to a process of collaborative inquiry of individual members of an organization for "testing and restructuring of organizational theories of action in the organizational context as in the individual one" (Argyris & Schon, 1978, p.11).

Organization members act according to their cognitive maps and frames with particular expectations about outcomes. If there is a mismatch between expectations and outcomes, than the mismatch is called an error (Argyris & Schon, 1978; Dery, 1982). When the error occurs, organizational members may detect an error in organizational theory-in-use and correct it (single-loop learning), or they might start to change their frames and maps (double-loop learning). These two processes underlie the process of learning to learn (deuterio learning).

Single-loop learning is generally defined as a process of error detection and correction where organizations are permitted to carry on their present policies or pursue their own goals. Within a model of learning systems, single-loop learning occurs when new behavioral strategies are used in the service of the same governing variables (Valenca Pereira, 1990).

Double-loop learning "occurs when error is detected and corrected in ways that involve the modification of an organization's underlying norms, policies, and objectives" (Argyris & Schon, 1978, p.3). This type of learning involves the modification or replacement of governing value, policies, and assumptions.

Deutero learning is defined as the learning of how to learn (Bateson, 1972). It expands theories-in-use and makes them more explicit. Deutero learning requires that organization members learn about the previous context of learning (Valenca Pereira, 1990); explores how organization members test and change their theory-in-use in response to experience (Schon, 1975); and uses unproved maxims for the learning process (Schon, 1975).

Organizational experimentation is learning through the availability and analysis of feedback (Huber, 1991). An organization must ensure the analysis of feedback of organizational actions and outcomes so that it can increase its learning efficiency through an increase in the level of

accuracy of feedback. Both these activities - ensuring the analysis of feedback and increasing its accuracy - are performed through organizational experimentation (Huber, 1991; Huber, Ulman, & Leifer, 1979; Straw, 1977; Wildavsky, 1972).

The literature on organizational experimentation draws two major conclusions: first, organizations learn from feedback intentionally; and second, organizational learning is a process of moving from currently undesirable toward desirable situations (Lindblom, 1959). Organizational learning in this approach resembles logical incrementalism where the most effective strategies emerge from an iterative process of probing the future, experimenting, and increasing feedback accuracy through a series of partial (incremental) commitments (Quinn, 1980).

Learning Organization Approach

Learning organizations (Senge, 1990, 1991) are organizations "where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together" (Senge, 1990, p.3).

A learning organization possesses (a) the ability to continuously learn, (b) openness to the environment, and (c) the need to expand its learning capacity. All these factors have to be present in order to improve quality, enhance

relations with customers and suppliers, more effectively implement strategy, increase customer satisfaction, and gain (and sustain) profitability (Mills & Friesen, 1992).

The continuity of learning is assured through five "component technologies": systems thinking, personal mastery, mental models, shared vision, and team learning (Senge, 1990, 1991).

Systems thinking helps to see patterns and relationships more creatively or change them in order to gain and sustain competitive advantage (Senge, 1990, 1991).

Personal mastery helps in continuously clarifying and deepening the personal visions, focusing of energies, developing patience, and seeing the reality more objectively (Senge, 1990). Personal mastery includes many practices and principles and is constituted by three important elements: personal vision, creative tension, and commitment to truth (Senge, 1991).

Mental models are basic assumptions, values, beliefs, norms, and images that influence the way individuals understand a reality and how they take actions (Senge, 1990, 1992). Mental models limit individuals to existing and familiar ways of thinking and solving problems (McKenna, 1992). Only if organizations are sufficiently flexible and open to the environment can mental models be changed and thus enable new ways of seeing and understanding reality.

Shared vision provides focus and energy for individuals

in the organization. Shared vision is a vision to which most of the members of the organization are truly committed, because it reflects their own personal visions (Senge, 1990). The possible gap between individual and organizational or shared vision might result in discouragement or other types of organizational misbehavior (McKenna, 1992). Personal commitment is crucial to the shared vision. Therefore, learning organizations must pay full attention to the process of building shared vision (Senge, 1990).

Team learning is defined as "a process of aligning a team to avoid wasted energy and to create desired results" (Senge, 1991, p.8), and is based on personal mastery and shared vision. It requires mastering practices of communication (McKenna, 1992), and coordinated actions (Senge, 1990).

Planning and Learning Laboratories

The learning organizations approach can also be used in analyzing organizational planning and learning laboratories as a means of organizational learning (De Geus, 1988; Galer & Van der Heijden, 1992; Stata, 1989).

Planning helps managers discover their current situation, their goals, and means and paths to accomplish the goals through the iterative process of learning (Galer & van der Heijden, 1992). Organizational learning is triggered by the need to understand changes in the environment and serves

as a means of adaptation of beliefs and behaviors to those changes (Stata, 1989). Organizational learning is enhanced if planning is accurately structured so that learning will come to the organization's full attention.

A learning laboratory is an organization that is dedicated to knowledge acquisition through learning (Leonard-Barton, 1992). A contribution to the knowledge which is embedded in tangible and intangible assets is the major criterion for all organizational activities and processes (Imai et al., 1985; Leonard-Barton, 1992).

A learning laboratory's purpose is to develop a learning process aimed at improving managers' shared vision and mental models, and to develop managers' abilities to view new situations in a more systematic and dynamic way (Senge & Sterman, 1992).

Learning laboratories do not emerge automatically or spontaneously. Rather, they are carefully designed, created, and maintained through continuous intervention and management actions, values and norms evaluations, and paying attention to communication (Leonard-Barton, 1992).

Strategic Management Perspective

The strategic management perspective reviews and analyzes causes and stimuli of organizational learning, organizational learning as a source of competitive advantage, and its sustainability.

Causes and Stimuli of Organizational Learning

Organizational learning is triggered by two sets of factors: first, it can be a response to environmental changes (environmental determinism), and second, it can be caused by a managerial desire to accomplish a particular goal (strategic choice). The environmental determinism concept and the strategic choice concept can be mutually independent (Astley & Van de Ven, 1983; Child, 1972; Weick, 1979) or can be interactively dependent (Bourgeois, 1984; Hrebiniak & Joyce, 1985; Lawless & Finch, 1989).

Environmental Determinism

Environmental determinism reduces the human choice to a simple reaction to the environmental change (Bourgeois, 1984; Burns & Stalker, 1961; Hannan & Freeman, 1977; Lawrence & Lorsch, 1967). Organization design is created as the automatic reflection of environmental complexity, and can be thus recognized as a modus of environment (Bourgeois, 1984). The organization as a modus of environment has then a limited

set of choices of responses to the environment (Thompson, 1967).

Strategic Choice

The strategic choice approach is an alternative view to environmental determinism. In this view, management retains a certain degree of autonomy to select the situation, domain, and industry, thus maintaining the process through which the managers "enact" their environment (Bourgeois, 1984; Child, 1972; Grandori, 1987; Weick, 1979). "Enactment" of environment does not refer only to the change or selection of the environment but also refers to the process through which the environment is modified by the presence and actions of a firm (Grandori, 1987). The strategic choice concept, however, is limited to the existing or given alternatives (Lado, Boyd, & Wright, 1992).

The limitation that strategic choices can only be made by choosing among existing alternatives can be overcome by the development of the strategic selection concept (Lado et al., 1992). Strategic selection reflects a more proactive and creative stance of top management.

Interaction of Environmental Determinism and Strategic Choice

Hrebiniak and Joyce (1985) distinguish between four different combinations of environmental determinism and strategic choice: minimum choice (low strategic choice and

high environmental determinism), differentiated choice (high strategic choice and high environmental determinism), maximum choice (high strategic choice and low environmental determinism), and incremental choice (low strategic choice and low environmental determinism).

Minimum choice or natural selection refers to the environment-firm structure where organizations have no control over external factors and can merely adapt to environment or react to its changes over time. Differentiated choice refers to such an environment-firm relationship where an organization "enjoys choice despite the peremptory nature of external forces and constraints" (Hrebiniak & Joyce, 1985, p.34). Maximum choice refers to the situation where an organization enjoys a high degree of autonomy in behavior and decision processes. Incremental choice reflects the situation in which an organization does not have high autonomy despite low impact of environmental forces.

Both environmental determinism and strategic choice provide incentives or thrusts for change, and both are the cause as well as the effect of the other in adaptation processes. In the strategic management literature environmental determinism is primarily used in the industrial organizational approach and the strategic choice/selection is primarily adopted by the resource-based approach.

Organizational Learning and Competitive Advantage

From a strategic point of view, organizational learning has to result in competitive advantage. Moreover, organizational learning that does not result in improving a firm's performance cannot be strategically justified. Ultimately, improved performance can be accomplished through changing and improving a firm's activities and operations.

Competitive advantage is a result of positional and performance superiority that is based on activities, skills, and resource superiority (Day & Wensley, 1988). Organizational activities, skills, and resources thus represent the potential ability that a firm can perform better than its competitors.

The management literature distinguishes between two theories that analyze the process of achieving and sustaining competitive advantage (Lado et al., 1992): (a) industrial organization theory (Bain, 1956; Ghemawat, 1986; Mason, 1939; Porter, 1980, 1985) that primarily focuses on the creation of competitive advantage and favors the environmental determinism approach; and (b) resource-based theory (Barney, 1986, 1988, 1991; Dierickx & Cool, 1989; Peteraf, 1993; Reed & DeFillippi, 1990; Rumelt, 1987) that focuses on the sustainability of competitive advantage and favors a strategic choice approach.

Industrial Organization Theory

The industrial organization theory is based on three major assumptions (Barney, 1991): first, firms within an industry are identical with respect to the strategically relevant resources they control (Porter, 1981); second, potential heterogeneity of an industry or group is short lived because the firm's resources are highly mobile (Barney, 1986; Hirshleifer, 1980); and third, firms respond to selective pressures from the environment (Lado et al., 1992).

Organizational activities, skills, and resources can all be sources of competitive advantage. They can be examined by using the value-chain analysis (Porter, 1985; Porter & Millar, 1985).

Value-chain analysis. The value-chain framework breaks down the business process into relevant activities. These activities are, together with skills and resources, a potential source of value creation (Reimann, 1987). Organizational activities are technologically and economically distinct (Porter & Millar, 1985) and can be typified into two generic categories: primary (line) activities which are involved in the physical creation of the product, its logistics and its support and servicing after sale; and support (staff) activities that service the primary activities by providing them the inputs and the infrastructure (Porter, 1985; Porter & Millar, 1985; Reimann, 1987). Using the criterion of creating competitive advantage, activities can

be divided into three types: direct activities which are directly involved in a process of value creation, indirect activities which enable the firm to perform direct activities, and monitoring activities which ensure the quality and reliability of other activities (Reimann, 1987).

Industrial organization theory has not developed an explicit theory of organizational learning. That is primarily due to industrial organization theory's perception of organization as being a modus of the industry. Organizational learning is confined to an experience curve analysis (BCG, 1972; Yelle, 1979).

Industrial organization theory suggests that "the cost of value activities can decline over time due to learning that increases its efficiency" (Porter, 1985, p.73). Methods and techniques of learning by which an organization can reduce costs are numerous such as, for example, layout changes, better utilization of assets, etc. Learning rates differ across different value-chain activities primarily due to different possibilities for learning improvements, and management attention given to learning (Ghemawat, 1986; Porter, 1985).

To summarize, industrial organization theory contributes to understanding organizational learning in two ways: first, organizational learning must result in competitive advantage in order to be strategically justified; second, organizational learning has numerous different methods and techniques which

primarily affect organizational activities, skills, and resources; third, organizational environment is a primary cause or a trigger of organizational learning.

Resource-Based Theory

Resource-based theory is based on the theoretical underpinnings of Schumpeterian theory of the firm (Schumpeter, 1942) and has three central concepts: (a) firm resources, (b) competitive advantage, and (c) sustained competitive advantage (Barney, 1991).

Firm resources include all assets, capabilities, firm attributes (i.e. reputation, knowledge, etc.) that are controlled by the firm in order to improve the efficiency and effectiveness of the firm (Barney, 1991; Daft 1983; Tomer, 1987; Wernerfelt, 1984; Williamson, 1985).

Competitive advantage is attained when a firm implements "a value creating strategy not simultaneously being implemented by any current or potential competitor" (Barney, 1991, p.102).

Sustainable competitive advantage is attained when the advantage cannot be duplicated (Aaker, 1989; Grant, 1990; Reed & DeFillippi, 1990; Rumelt, 1984; Williams, 1992). Sustainability of competitive advantage presumes the existence of barriers to imitation (Conner, 1991; Day & Wensley, 1988; Reed & DeFillippi, 1990), and can only be meaningful if customers perceive a consistent difference in

product or service, and if capability gaps endure over time (Coyne, 1986). Sustainability of competitive advantage is thoroughly explored by resource-based theory.

The resource-based theory encompasses three different, yet interrelated theses for the explanation of sustained competitive advantage: (a) ambiguity thesis, (b) strategic factor thesis, and (c) rent-seeking thesis.

The ambiguity thesis suggests that the most effective way to deter potential competitors and, thus, to achieve a sustainable competitive advantage, is to decrease the competitor's understanding of the firm's competencies (Lippman & Rumelt, 1982). The ambiguity may block competitors' imitation, or competitive benchmarking, and factor mobility by increasing the entry barriers. The ambiguity thesis also suggests three different characteristics of competencies: tacitness, complexity, and specificity (Reed & DeFillippi, 1990).

Tacitness (Polanyi, 1967) implies that knowledge is embedded in organizational skill-based competencies and is the result of experiential organizational learning (Nelson & Winter, 1982).

Complexity refers to the relationship between the range interrelationships among the skill-based competencies and other knowledge-based competencies (Lado et al. 1992; Winter, 1987). From the organizational learning view, complexity refers to the breadth and depth of firm-specific knowledge

which is difficult to duplicate or imitate (Nelson & Winter, 1982).

Specificity is the extent to which competencies are idiosyncratic to a firm (Williamson, 1979, 1985). Specificity is pertinent to a particular transaction, and can inhibit imitability and generate value for the firm.

The strategic factor thesis is based on the concept of uniqueness (Barney, 1986, 1989). This thesis suggests that a firm may gain abnormal returns by having unique competencies or by simply being lucky in acquiring undervalued resources on the market. Over a period of time a firm accumulates non-tradeable assets that are unimitable, complex and ambiguous, and can, thus, be a source of sustainable competitive advantage (Dierickx & Cool, 1989).

The rent-seeking thesis states that a firm's ultimate goal is a rent that cannot be offset by costs (Amit & Schoemaker, 1993; Peteraf, 1993). Peteraf's argument is the most comprehensive one developing four criteria for analyzing sustainability of competitive advantage: heterogeneity, ex post limits to competition, imperfect mobility, and ex ante limits to competition (Peteraf, 1993).

Heterogeneity of assets is defined as the difference in levels of efficiency among different assets in the firm (Barney, 1991; Peteraf, 1993) and implies that firms are able to compete in the market on a long term basis continually seeking rent (Bowman, 1974). Ex post limits to competition

represent the conditions of rents sustainability in the form of imperfect imitability (Lippman & Rumelt, 1982; Peteraf, 1993; Rumelt, 1987) and imperfect substitutability (Barney, 1991; Porter, 1980). Ex ante limits to competition prevent costs from offsetting the rents (Peteraf, 1993). Imperfect mobility means that resources cannot be traded (Dierickx & Cool, 1989), as discussed earlier in the relation to the ambiguity thesis and the strategic factor thesis.

Organizational learning within the resource-based framework is not confined to incremental improvements but is based on Schumpeterian perpetual innovation and creative destruction (Best, 1990). The organizational learning goal is not an increase in the efficiency of production, but a reduction of costs of organizational activities through innovation (Nelson & Winter, 1982). The resource-based theory views a managerial behavior towards the environment as proactive, so that competitive advantage is not merely a result of organization-environment fit, but, rather, emerges as a function of a firm's distinctive or specific competencies (Ansoff, 1965, 1976; Hofer & Schendel, 1978; Meyer, 1991; Selznick, 1957) that are deployed and managed by managers.

In sum, the resource-based theory offers some substantial contributions to understanding organizational learning: first, organizational learning is not only an incremental process but includes a search for innovation and allows historical jumps; second, organizational learning is

primarily based on managerial volition to increase the competitive position of a firm.

CHAPTER IV

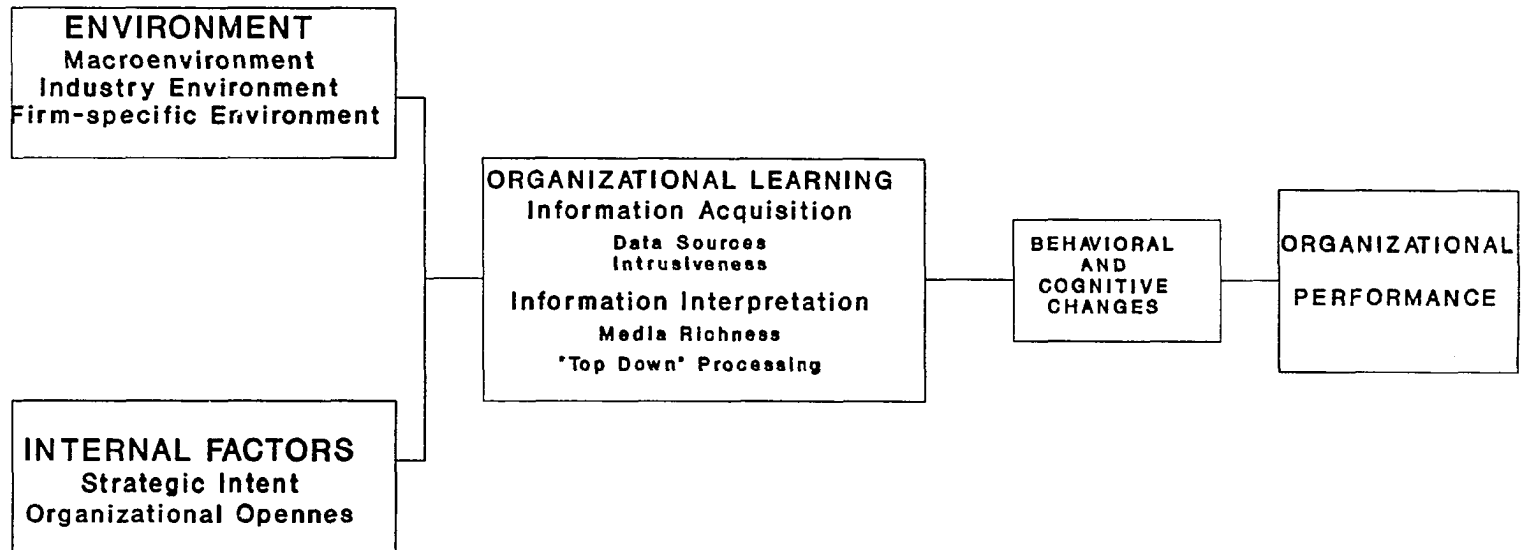
RESEARCH MODEL OF ORGANIZATIONAL LEARNING

Research Model Development

The purpose of the research model (see Figure 3) is two-fold: first, to integrate the processes of the four perspectives of organizational learning into a model of organizational learning; and second, to develop hypotheses for empirical analysis of organizational learning.

The model is based on a theoretical review of organizational learning which is distilled into (a) determinants (environmental and internal factors), (b) process (information acquisition and information interpretation), (c) outcomes (cognitive and behavioral changes), and (d) organizational performance. The proposed research model is an extension and refinement of Daft and Weick's model of organizational learning (Daft & Weick, 1984) that consists of three phases of organizational learning (scanning, interpretation, and learning) which are the phases that can be matched with information acquisition, information interpretation, and behavioral-cognitive changes in our model.

Figure 3. Organizational learning model



Determinants of Organizational Learning

Organizational learning is induced by environmental and internal factors. The strategic management perspective on the relationship between environment and organizational learning is based on the findings of the industrial organization literature, while the relationship between internal factors and organizational learning is primarily based on the resource-based theory literature.

Environmental Factors

The environment is broadly defined as a residual category of "everything else" but the organization (Dill, 1958; Thompson, 1967). Environmental factors consist of macroenvironment, industry-specific environment (Abell & Hammond, 1979; Dess & Beard, 1984; Glazer, 1990; Kerin, Mahajan, & Varadarajan, 1990; Porter, 1980; Reimann, 1987), and firm-specific environment (Glazer, 1990).

The macroenvironment can have a significant impact on industry and includes an almost limitless variety of potentially important factors. These factors can be summarized into five major forces: regulatory, economic, global, social, and technological (Reimann, 1987).

The industry-specific environment has three dimensions: munificence, dynamism, and complexity (Dess & Beard, 1984). Environmental munificence is the extent to which the environment can support sustained growth. This means that

organizations search for the environments that provide opportunities for growth and stability (Day, 1977; Glazer, 1990). Environmental dynamism relates to environmental stability-instability characteristics (Aldrich, 1979; Jurkovich, 1974; Miles, Snow, & Pfeffer, 1974). Environmental complexity reflects the heterogeneity of organizational activities and their range (Child, 1972; Thompson, 1967; Tung, 1979).

The changes and riskiness of macroenvironment and industry-specific environment that can force organizations to adjust by translating the environmental changes to the individuals within the organization in the form of organizational learning (March & Olsen, 1975). Such changes can be referred to as environmental turbulence (Drucker, 1980; Fiol & Lyles, 1985; Hedberg, 1981; Peters, 1987) which is also defined as "more events per unit of time" (Glazer, 1990, p.7). A turbulent environment requires a larger scale of information acquisition and information interpretation activities (due to a higher rate of environmental changes and riskiness in such an environment) (Glazer, 1990). However, an extremely high level of environmental turbulence might incur information overload and actually have a negative impact on information acquisition and information interpretation activities (Lawrence & Dyer, 1981).

The firm-specific environment consists of "market attractiveness," such as location, size, market share, and

product life cycle (Day, 1977; Glazer, 1990). The latter is an important concept for organizational learning because it includes the presence of information flows.

Internal Factors

The resource-based model suggests that organizational learning can be triggered by "intrinsic managerial factors" and not only as a response to a changing environment. The internal factors that determine organizational learning are strategic intent and organizational openness.

Strategic intent. Strategic intent is generally defined as a sustaining obsession to be the best at all levels of the organization (Hamel & Prahalad, 1989). Such a definition of strategic intent can serve many specific functions, such as to (a) capture the essence of winning, and seek the most efficient allocation of scarce resources in the long-run, (b) articulate corporate strategic focus and challenges in the medium-run, and (c) provide consistency to short-term actions and help reduce risk in the short-run (Hamel & Prahalad, 1989; Lado, 1992).

Strategic intent creates a sense of urgency, searches for weaknesses in the firm's own and competitors' competitive position that can provide a competitive advantage if appropriately addressed (Hamel & Prahalad, 1989; Przybylowicz & Faulkner, 1993). Strategic intent is stable over time so that it provides consistency to short-term action but leaves

enough room to management and employees for creativity and continuous reinterpretation in the case of environmental changes (Hamel & Prahalad, 1989). Such a view on strategic intent means that an organization must not only have some long-term focus but also the willingness to change its short-term behavior and cognition, if necessary, to accomplish long-term goals.

Organizational learning is a function of strategic intent implying that organizations learn not only due to forced learning but also due to anticipatory learning (Crossan, 1991). Strategic intent can be dimensionalized into efficiency and differentiation thrust that is dimensionalization similar to Lado's efficiency and innovation thrust (Lado, 1992) but better describes the intentions of the service industry. The trade-off between efficiency and differentiation thrust results in four types of strategic intent (marginalist, entrepreneurial, incrementalist, and quantum) (Lado, 1992).

Organizations with low strategic intent have a low impetus to learn new procedures, to increase organizational skills, or to search for new meanings of information or innovation breakthrough and are primarily oriented toward lower level or routine-based learning (Fiol & Lyles, 1985).

Organizations with high differentiation and low efficiency thrust (entrepreneurial strategic intent) try out new combinations of resources and skills through the process

of Schumpeterian "creative destruction," thus seeking high organizational rents (Spender, 1993). Such organizations have a high inclination toward higher-level learning such as learning through direct experience, experimentation, and double-loop learning (Senge, 1990; Argyris & Schon, 1978).

Organizations with low differentiation and high efficiency thrust (incrementalist strategic intent) emphasize cost minimization through incremental improvements in their activities and behavioral developments (Porter, 1980; Quinn, 1980). Such organizations are inclined towards second-hand learning and single-loop learning.

Organizations that are high in differentiation and efficiency thrust (quantum strategic intent) try out new combinations of resources and skills, and try to achieve a high level of efficiency in their activities. Such organizations will use the integral learning that combines high and low-level learning (Crossan, 1991).

Organizational openness. Organizational openness has two dimensions: transparency and receptivity (Hamel, 1991). Transparency refers to an openness of an organization towards other competitors and accessibility of specific knowledge of the organization. Hamel (1991) distinguishes four determinants of transparency: (a) penetrability of the social context, (b) attitude towards outsiders, (c) accountability and discreteness of distinctive competencies, and (d) the rate of skill-building.

The concept of transparency is inversely related to organizational ambiguity and imitability. Thus, organizations with higher barriers to transparency - passive or acquired - have inherent advantage against competitors. Receptivity is another dimension of organizational openness and is defined as the organization's relative willingness to apply new information, findings, and methods comparable to its competitors (Hamel, 1991).

Process of Organizational Learning

The process of organizational learning represents the heart of the model developed for this research. The approach taken reduces organizational learning to information processing that includes acquisition and interpretation. This is supported by three major theoretical arguments: (a) the information processing approach is based on the theory of organization as institutionalized brains and principles of cybernetics that were chosen as the major theoretical bases of organizational learning; (b) most authors address organizational learning by using the information processing view (Daft & Lengel, 1986; Huber, 1991); (c) the information processing approach covers the majority of different types of organizational learning and their related processes that were thoroughly explored in the second chapter.

Information acquisition. The purpose of information acquisition is to reduce uncertainty (Daft & Lengel, 1986).

Uncertainty is defined as the absence of information (Miller & Frick, 1949; Shannon & Weaver, 1949; Tushman & Nadler, 1978); so when "information increases, uncertainty decreases" (Daft & Lengel, 1986, p.556). Information acquisition is characterized by two variables: type of data sources and intrusiveness of the organization (Daft & Weick, 1984).

Data sources can be either external or internal (Aguilar, 1967; Daft & Lengel, 1986; Keegan, 1974). External sources represent the managers' direct contacts with an information source outside the organization and internal sources represent the data collection by the people in organization which is then provided to managers through internal organizational channels (i.e. reports).

Organization intrusiveness is the extent to which organizations actively intrude into the environment ("informational enactment") by searching for information (Daft & Weick, 1984). Active organizations allocate resources to search activities (such as forecasting, hiring the experts, establishing special research departments, subscribing to monitoring services, etc.) (Thomas, 1980; Weick & Daft, 1983; Wilensky, 1967). Passive organizations accept whatever information the environment provides (Fahey & King, 1977).

Information interpretation. The purpose of information interpretation is to reduce information equivocality. Equivocality, as explained earlier in the text, means an existence of multiple and conflicting interpretations about an

organizational situation (Daft & Macintosh, 1981; Weick, 1979). High equivocality means lack of understanding and confusion (Daft & Lengel, 1986). The information interpretation is characterized by two variables: media richness (Daft & Weick, 1984) and "top-down" processing (Martello, 1993).

Media richness refers to the capacity of different organizational media to process information. In order of decreasing richness, the organizational media can be classified as personal contacts, team meetings, committees as decision makers, telephone contacts, written memos and letters, special reports, formal chain of command reporting (Daft & Lengel, 1986).

"Top-down" processing assumes that one's previous experience and the context of that experience provide a valid analytical framework for understanding the coming events (Martello, 1993). The purpose of "top-down" processing is to increase the understanding of the information by the employees on the lower levels of organizational structure. "Top-down" processing depends on the richness of detail (Martello, 1993) and the frequency of information cycles or dissemination through different information channels (Daft & Weick, 1984) using message routing and message summarizing (Daft & Huber, 1991). Message routing reflects the selection of information disseminated and message summarizing deals with the amount of

information needed to reproduce its meaning (Daft & Huber, 1987).

Outcomes of Organizational Learning

Organizational learning results in "accompanying changes" (Garvin, 1993, p.80). If organizational learning does not produce any cognitive and behavioral changes, then organizational learning de facto did not occur, leaving only a potential for improvement (Crossan, 1991; Fiol & Lyles, 1985; Garvin, 1993). Cognitive and behavioral changes (the content of organizational learning) represent two different phenomena. Behavioral changes may occur without the changes in cognition and vice versa. The relationship between behavioral changes and cognitive changes is depicted in Figure 4.

Small changes in behavior do not have the tendency to bring major cognitive change, nor are major behavioral changes accompanied by cognitive change. Fiol and Lyles (1985) describe four typical situations between cognitive and behavioral change that vary depending on the level of cognitive and behavioral change.

Figure 4. Relationship between cognitive and behavioral changes

Cognitive changes	High	C	D
	Low	A	B
		Low	High
		Behavioral changes	

Source: Fiol & Lyles (1985)

Situation A is typical for mechanistic organizations or have low strategic intent in stable and predictable environments. Success programs have been ingrained in such organizations and no learning and no attempts to change take place. Situation B represents the organizations that keep taking actions, changing strategies, and restructuring. Such organizations have high efficiency intent in unpredictable environments. Situation C represents high cognitive changes (i.e. new interpretations) and low behavioral changes. Fiol and Lyles (1985) imply that such a situation is typical for a turbulent environment and for organizations with high innovation intent that produces cognitive changes. Situation D is typical for organic organizations with high strategic intent in a moderately turbulent environment.

Cognitive changes have two distinguishable levels of learning (Fiol & Lyles, 1985). Lower-level learning reflects the changes within a fixed organizational structure. Such learning changes are short in duration and only partially affect organizations (Argyris & Schon, 1978; Duncan, 1974; Fiol & Lyles, 1985). Higher-level learning reflects the changes in overall rules and norms or cognitive mappings (Argyris & Schon, 1978; Miller & Friesen, 1980; Starbuck et al., 1978).

Organizational Performance

The relationship between behavioral and cognitive changes and organizational performance is best described by Garvin: "And the third step (of organizational learning) is performance improvement, with changes in behavior leading to a measurable improvements in results: superior quality, better delivery, increased market share, or other tangible gains; because cognitive and behavioral changes typically precede improvements in performance, a complete learning audit must include all three" (Garvin, 1993, p.90).

When the organization achieves superiority of organizational performance compared with other competitors, this superiority is referred to as competitive advantage (Porter, 1980). Competitive advantage can be measured by using different measures such as level of customer satisfaction (Ulrich & Lake, 1991), loyalty (Day & Wensley, 1988), market share (Day & Wensley, 1988), profitability (Day & Wensley, 1988; Reimann, 1987) or firm value (Reimann, 1987).

CHAPTER V

RESEARCH DESIGN AND METHODOLOGY

This chapter has five sections: (a) research hypotheses, (b) research design, (c) sampling procedure, (d) questionnaire development, and (e) data collection procedure.

Hypotheses

The hypotheses of organizational learning and competitive advantage are based on the research model developed earlier. The first four hypotheses address the first research question: What factors are conducive to organizational learning? The fifth and sixth hypotheses address the second research question: What processes of organizational learning are conducive to organizational performance and competitive advantage?

Hypothesis 1: Environmental turbulence. This hypothesis is used to test the significance of the relationship between the environmental turbulence and the organizational learning process.

In a highly turbulent environment organizations are prone to high levels of information acquisition and

information interpretation due to a high rate of environmental change and riskiness (Glazer, 1990; Lawrence & Dyer, 1981).

H1. Environmental turbulence will have positive relationships with information acquisition and information interpretation.

Hypothesis 2: Strategic intent. This hypothesis is used to test the significance of the relationship between strategic intent and the organizational learning process.

Theoretical work of Hamel and Prahalad (1989) suggests that strategic intent constantly creates a sense of exploration of new opportunities on the market and implies a constant search for competitors' weaknesses. Lado's (1992) empirical findings confirm strategic intent as an important variable in strategic management.

H2. Strategic intent will have positive relationships with information acquisition and information interpretation.

Hypothesis 3. Organizational openness. This hypothesis is used to test the significance of the relationship between organizational openness and the organizational learning process.

Organizations that have low levels of organizational openness and do not monitor the environment may miss a lot of market opportunities and might not be able to react accurately to threats in the environment (Hamel, 1991). Organizational openness contributes to the organizational learning process in a positive direction since it enhances organizational

willingness to apply new information and technology comparable with other competitors.

H3. Organizational openness will have positive relationships with information acquisition and information interpretation.

Hypothesis 4. This hypothesis is used to test the significance of relationships between the joint effects (interactions) of environmental turbulence, strategic intent, and organizational openness, and the organizational learning process.

The interactions between external factors (environmental turbulence) and internal factors (strategic intent and organizational openness) theoretically reflect the degree of choice organizations have in an environment-firm relationship. Minimum choice appears when organizations have no control over external factors and can merely adapt to the environment or react to its changes over time, while maximum choice appears when an organization enjoys a high degree of autonomy in behavior and decision processes (Hrebiniak & Joyce, 1985).

H4. The joint effects of combinations among environmental turbulence, strategic intent, and organizational openness will have positive relationships with information acquisition and information interpretation.

Specifically:

H4.1. The joint effect (interaction) of environmental turbulence and strategic intent will have positive

relationships with information acquisition and information interpretation.

H4.2. The joint effect (interaction) of environmental turbulence and organizational openness will have positive relationships with information acquisition and information interpretation.

Hypothesis 5: Behavioral and cognitive changes. This hypothesis is used to test the significance of relationships between the process and outcomes of organizational learning. A summary of findings that support this hypothesis is given by Fiol & Lyles (1985).

H5. Information acquisition and information interpretation will have positive relationships with behavioral and cognitive changes in an organization.

Hypothesis 6: Organizational performance. This hypothesis is used to test the significance of relationships between behavioral and cognitive changes and organizational performance.

H6. Behavioral and cognitive changes will have a positive relationships with organizational performance.

This hypothesis tests whether organizational learning can be considered as an "isolating mechanism" (Mahoney, 1992) that can lead to competitive advantage. The industrial organization literature (Porter, 1980, 1985; Garvin, 1993; Ghemawat, 1985) and the resource-based theory provide theoretical support for this hypothesis.

Research Design

Research design is primarily driven by the nature of the problem researched and given theoretical and methodological limitations. This study uses a non-experimental, fixed effect, one-group, cross-sectional, and one-industry research design.

Independent variables are antecedents of organizational learning. The intervening variables are variables that describe organizational learning. Organizational performance is an outcome of organizational learning and represents the dependent variable. Organizational performance will be controlled by extraneous independent variables (Kerlinger, 1986) that describe the firm-specific environment. Dimensionality of each construct will be determined by factor analysis. The relationships among the variables will be tested by multivariate data analysis.

The industry chosen to test the hypotheses is the credit union industry (SIC 606). This industry was chosen for the following ex-ante reasons: (a) it is a fast growing service-related industry with an expanding range of services offered; (b) the consumer banking market in which credit unions operate requires a high level of adaptability to external change and a high level of alertness to environmental information; (c) this industry has not yet received significant attention in strategic management research; (d) not-for-profit organizations are "one of the most fruitful areas for research

in strategic management" (Wortman, 1979, p.353); (e) prior surveys indicate a high level of cooperativeness of general managers and CEOs of credit unions (Reichert & Rubens, 1994); and (f) detailed data bases are available through Ferguson and Company.

Finally, the one-industry approach is becoming more and more popular in strategic management area of research (i.e. Cool & Schendel, 1988) primarily because it increases the richness of investigation and excludes interindustry differences.

Some Credit Union Industry Characteristics

Credit unions are not-for-profit organizations in which members, who are also the owners, share a common bond in depositing funds and obtaining credit. (Report to Congress, 1991, p.23). The unique feature of credit unions is this common bond. The bond is usually the place of employment or the occupation of the members (occupational bond) but it can also be based on association ties, such as church or union membership (associational bond), or area of residency (community bond) (Pearce, 1984). Credit unions, unlike the other federally insured depository institutions, are exempt from federal income taxation. Such a status enables them to charge less for loans or to pay more on deposits compared to their competitors.

In the U.S. there are 14,564 credit unions with more

than 55 million members and \$216 billion in assets (CUNA, The Credit Union Report, 1991). The credit union industry has grown dramatically in recent years: during 1985-1990 assets increased by 63 percent compared to a 24 percent growth in assets in commercial banks, and 9.4 percent in assets of thrifts - two major industries competing with credit unions.

The reasons for such a rapid expansion of the credit union industry are - beside institutional characteristics - (a) the removal of interest rate ceilings on share accounts, (b) loosening of the bond requirement, (c) expanded asset power, and (d) broader diversification in lending (Reichert & Rubens, 1994; Report, p.214).

Competitiveness

Firms are considered to be direct competitors if they provide essentially equivalent services to the same set of customers. The credit union industry primarily competes with commercial banks and thrifts for consumers of banking services (i.e. savings account, transaction account, mortgage loan, etc.) (Heaton & Dunham, 1985). The critical issue of whether credit unions are direct competitors with each other or with commercial banks and thrifts depends on what services they offer to their customers.

Performance

Due to the specific nature of the credit union industry, "profitability" has no clear meaning (Cox & Whigham, 1984); therefore, researchers of credit union performance use different measures of efficiency as substitutes for profitability measures.

Most performance studies have measured credit unions' operating performance based on asset size, parent-organization business stability, operational efficiency, regulatory changes, and economies of scale (Reichert & Rubens, 1994). Researchers have found conflicting results on the following issues: (a) size as an important determinant of performance differences (Cox & Whigham, 1984; Kohers & Mullins, 1987); (b) credit unions in an unstable environment experience higher delinquency rates (Kohers, 1986; Kohers & Mullins, 1986); (d) more efficient credit unions deliver lower loan rates and reduce service charges (Cox & Whigham, 1984); (e) regulatory changes affect credit unions (Clair, 1984; Wolken & Navratil, 1985); (f) the presence of economies of scale (Flannery, 1974; Kohers & Mullins, 1988; Koot, 1978; Taylor, 1972; Wolken & Navratil, 1980).

Sampling Procedure

Ohio credit unions were stratified into four categories based on a credit union's asset size similar to Reichert and Rubens' (1994) breakdown: (a) small (\$1-4.9 million in asset

size), (b) medium (5-19.9 mil.), (c) large (20-99.9 mil.), and (d) very large (above 100 mil.). Following the procedure used by Reichert and Rubens (1994), the very large group, large group, and medium group were "over-sampled" and the group of small size credit unions were "under-sampled."

Stratified Sampling Procedure

The assumptions of the stratified sampling procedure were: (a) desired statistical confidence level was 95 percent; (b) maximum allowable percentage error of the population portion was 5 percent, and assumed population proportion for the typical question 50 percent which maximizes the required sample size; (c) survey assumed 30 percent useable response rate based on one mailing, which is the response rate usually expected in the strategic management surveys.

The sample size was then computed through three steps (Appendix A). The results of stratified random sampling and the assumptions of sampling procedure are given in Table 2.

Table 2

Survey Sample Results

Assets size	Size designation	Ohio population ^{a,b}		Sample ^{c,d}	
		Number	Percent	Number	Percent
\$1-4.9Mill.	Small	252	55.4	81	40.5
\$5-19.9Mill.	Medium	135	29.7	70	35.0
20-99.9Mill.	Large	61	13.4	42	21.0
>100Mill.	Very Large	7	1.5	7	3.5
		<u>455</u>	<u>100.0</u>	<u>200</u>	<u>100.0</u>

Note. ^aMembers of Ohio Credit Union League in 1993.

^bThe structure of Ohio credit unions is almost identical to U.S. structure and is, thus, a good representation of U.S. population (Reichert & Rubens, 1994). ^cExclusion of the credit unions with the asset size below \$1 Million eliminated 167 credit unions from the Ohio sampling frame. ^dA percentage size breakdown for the sample does not match the corresponding percentages the population. This is expected with the stratified random sampling procedure where size groups with relatively few observations are purposely "over-sampled" and size groups with large number of observations (small credit union group) are purposely "under-sampled."

Questionnaire Development
Operationalization of Constructs

Measures

The hypothesis testing approach in this research requires the use of a questionnaire as an instrument of data collection. Steps that are involved in the questionnaire development are (Churchill, 1991): (a) definition of the theoretical basis of the constructs (see Table 3), (b) operationalization of constructs, and (c) development of a measurement instrument - questionnaire. (Specific steps taken in development of the questionnaire are described in Appendix B.)

Cool and Schendel's observation that operationalization of the construct under observation "is always a function of the industry under study" (Cool & Schendel, 1988, p.212) is also used in this dissertation. Whenever possible measures used in prior studies were applied. In many instances the relative lack of empirical research on organizational learning in strategic management required the construction of new measures for this dissertation. In those cases the measures were developed from theoretical investigations. External validity of those measures is, however, yet to be proven. All scales used in the questionnaire are the 5-point Likert scale.

Table 3

Theoretical Bases of Organizational Learning Constructs

Construct	Theoretical basis	Supporting research
External Factors	Environmental Determinism	Bourgeois, 1984; Burns & Stalker, 1961; Hannan & Freeman, 1977; Lawrence & Lorsch, 1967; Thompson, 1967
Internal Factors	Strategic Choice	Grandori, 1987; Hrebiniak & Joyce, 1985; Weick, 1979
Strategic Intent	Resource-Based Theory	Hamel, 1991; Hamel & Prahalad, 1989; Prahalad & Hamel, 1990
Organizational Openness	Resource-Based Theory	Hamel, 1991; Lippman & Rumelt, 1982; Reed & DeFillippi, 1990
Information Acquisition	Institutional "Brain" Theory; Cybernetics	Ashby, 1956; Morgan, 1986; von Bertalanffy, 1968; Wiener, 1961
Information Interpretation	Information Processing Theory	March & Simon, 1958; Weick, 1969
Behavioral/ Cognitive Changes	Action Learning; Cognition-Behavior Fit	Argyris & Schon, 1978; Crossan, 1991; Fiol & Lyles, 1985
Performance/ Competitive Advantage	Strategic Management: I/O Theory; Resource-Based Theory	Barney, 1988, 1991; Ghemawat, 1986; Peteraf, 1993; Porter, 1980, 1985; Reed & DeFillippi, 1990; Rumelt, 1987

Measures of Organizational Learning Determinants

Environmental turbulence. The methodology for measuring the environment in terms of complexity, munificence, and dynamism (Dess & Beard, 1984) appeared to be unsuitable for one-industry studies as this one. Instead, an expanded and refined measure of perceived environmental turbulence was used (Covin & Slevin, 1989; Duncan, 1972; Khandwalla, 1977; Miller & Friesen, 1982; Slevin & Naman, 1991; Snyder & Glueck, 1982). (Questionnaire is given in Appendix F.)

Strategic intent. Strategic intent in an organizational learning study has to reflect the willingness of a firm to learn in order to achieve performance superiority. So far, however, one of few measures of strategic intent was constructed for assessing the cross-border alliance choice (Lado, 1992). The measure of strategic intent by Lado was modified and tailored for organizational learning purposes.

Organizational openness. Organizational openness can be measured as one dimension of organization organicity (Naman & Slevin, 1993) that reflects organizations' relationships to other organizations, institutions, and forces. The existing measures of organicity (Khandwalla, 1977; Naman & Slevin, 1993) are not sophisticated enough for the current study to accurately reflect organizational openness. Based on the theoretical research by Hamel (1991), new measures of organizational openness have been introduced that reflect the underlying constructs of receptivity and transferability.

Measures of the Organizational Learning Process

In contrast to numerous attempts to conceptualize organizational learning, there have been very few attempts to actually measure it. Most of the empirically oriented literature on organizational learning focused primarily on learning and experience curves which are incomplete measures of organizational learning (Garvin, 1993, p.89). Using a single measure (i.e. cost or price) of organizational learning is not adequate due to its multi-faceted nature. Also, the existing literature on organizational learning has not produced measures of different aspects of organizational learning. Therefore, new measures for information acquisition and information interpretation are developed in this study.

Information acquisition. Measures of information acquisition are based on the various theoretical concepts that were shown in the literature review section. Items on data sources are constructed so that they reflect congenital learning, direct experience, trial-and-error learning, corporate intelligence, benchmarking, and grafting methods of credit unions (see Table 1, p.11). Items for organizational intrusiveness are based on the conceptual development of Daft and Weick (1984).

Information interpretation. Media richness items reflect the type of media proposed by Daft and Lengel (1986).

"Top-down" information processing items are based on conceptual development of causal schema (Martello, 1993).

Measures of Organizational Learning Outcomes

Behavioral and cognitive changes. The organizational learning process results in cognitive and behavioral changes or developments. Cognitive changes have been addressed in the literature on script and schema. Despite the fact that the importance of the literature on script and schema has been recognized (Crossan, 1991), there have been very few empirical examinations of the schemata (Huff, 1990). In addition, most of the existing empirical literature on cognitive developments either used a longitudinal approach or direct observation and interviewing as a method of studying schemata. Behavioral change measures are based on the theoretical framework of the value-chain analysis, thus reflecting the changes in the adequate activities of credit unions.

The non-experimental cross-sectional research design of this study implies the need for construction of new measures of cognitive and behavioral changes that would capture the top managers' perceptions about the cognitive and behavioral changes in the last three years (Zahra & Covin, 1993) (see Table 4).

Table 4

Operationalization of Organizational Learning ConstructInformation Acquisition

(1) Data sources

- organization members
- previous experience
- new methods, techniques with unpredictable outcomes
- reports on credit union industry
- reports from the outside of credit union industry
- special reports and articles about credit union industry
- other credit unions
- commercial banks and thrifts
- new employee's expertise
- joint task and mergers

Item 1 reflects congenital learning,
 item 2 reflects direct experience,
 item 3 reflects trial-and error learning,
 items 4-6 reflect corporate intelligence,
 items 7-8 reflect benchmarking practices of credit unions,
 and items 9-10 reflect grafting methods of credit unions.

(2) Intrusiveness

- top-managers' contacts to external institutions
- top managers' relation to board of directors
- employees searching for external information
- role of external sources for credit unions' operations

Information Interpretation

(3) Media richness

- personal contacts
- team meetings
- committees as decision makers
- telephone contacts
- written memos and letters
- special reports
- formal chain of command reporting

Items written memos and letters, special reports,
 and formal chain of command reporting are scaled reversed.

(4) "Top-down" processing of information

- the importance of informed subordinate for his/her performance
- information messaging
- information selection

(5) Behavioral and Cognitive Changes

(a) behavioral changes

- adaptability to environmental pressures
- quality of services
- number of new services offered
- technology of operations
- speed of operations
- average productivity of employees
- turnover of the employees
- satisfaction of the employees
- overall atmosphere

(b) cognitive changes

- personal communication emphasis
- employees' level of understanding of strategic orientation of credit union
- employees' level of understanding of major problems of the credit union
- efficiency of information systems within the credit union

Measures of Organizational Performance

Measuring performance of credit unions with profitability measures is not adequate, due to the institutional characteristics of the credit union industry. Since profitability has no clear meaning (Cox & Whigham, 1984) the use of "substitute" measures of performance was found necessary.

Most of the studies on the credit union industry have used different measures like asset size, (Cox & Whigham, 1984; Kohers & Mullins, 1987), delinquency rates (Kohers, 1986; Kohers & Mullins, 1986), loan rates, service fees/charges (Cox & Whigham, 1984; Clair, 1984; Flannery, 1974; Kohers & Mullins, 1988; Koot, 1978; Taylor, 1972; Wolken & Navratil, 1980, 1985). These studies use objective data for measuring organizational performance which is primarily because the studies were conducted by economic and financial researchers. This study uses the subjective data following the approach of some previous researchers (Gupta & Govindarajan, 1984; Reimann, 1972, 1982; Naman & Slevin, 1993) as well as the objective data. Despite the intuitive opinion that objective data are more reliable, the research conducted by Venkatraman and Ramanujam (1987) show no clear superiority of objective data.

In this study, CEOs were asked about their assessment of the importance of different measures of organizational performance, and their assessment of the value of this

performance measure compared with the expectations about this measure. Based on these responses for each credit union, an index of performance as the weighted average of the first and second scale was computed. In addition, objective data for organizational performance from the Ferguson & Company database of credit unions were used as an alternative measures of organizational performance.

The summary of measures and scales characteristics is given in Table 5.

Table 5

Summary of the Measures and Scale Characteristics of
Organizational Learning

Construct	Number of items	Source (Primary)
Environmental Turbulence	9	Khandwalla, 1977; Miller & Friesen, 1982; Naman & Slevin, 1993; Slevin & Naman, 1991
Strategic Intent	13	Lado, 1992
Organizational Openness	7	Khandwalla, 1977; Naman & Slevin, 1993
Organizational Learning Process		
(1) Data sources	10	Originally developed
(2) Intrusiveness	4	Daft & Weick, 1984
(3) Media richness	7	Daft & Lengel, 1986
(4) "Top-down"	3	Martello, 1993
Organizational Learning Content		
(1) Behavioral changes	10	Zahra & Covin, 1993
(2) Cognitive changes	5	Originally developed
Organizational Performance	16	Gupta & Govindarajan, 1984; Reimann, 1972, 1982
Total number of items	84	

Note. All scales are 5-point Likert scales.

Data Collection

Data were collected by using the modified Dillman's Total Design Method (Dillman, 1978) that guarantees the highest response rate. The method used included one mailing and selected follow-up and reminder calls. The targeted person in a credit union was the CEO or general manager. Prior to the mailing the questionnaire was tested for content and face validity by six CEOs of credit unions in the Cleveland area and by the president of the Ohio League of Credit Unions. The CEOs and the president of Ohio League of Credit Union provided valuable comments and proposed various refinements of the questionnaire that enhanced its face validity.

The number of credit unions that responded to our mailing was 85 indicating an effective response rate of 42.5 percent.

CHAPTER VI

RESULTS

This chapter has two major parts. In the first part, the results of validity and reliability assessments of major constructs are reported; and in the second part, the results of the hypothesis testing are presented.

Validity and Reliability Assessment

A measure that truly measures what it purports to has to be valid and reliable (Kerlinger, 1986; Peter, 1979; Venkatraman, 1989).

Validity Assessment

Construct Validity

The degree to which a construct achieves theoretical and empirical meaning is referred to as construct validity (Hughes, Price, & Mars, 1986). Construct validity requires convergent validity and discriminant validity of a measure (Kerlinger, 1986). Convergent validity is the extent to which the evidence from different sources about the construct indicates the same or similar meaning of the construct.

Discriminant validity is the extent to which a construct can be empirically differentiated from other similar constructs (Kerlinger, 1986).

Factor analysis is considered to be an indispensable method for determining convergent validity. It is a method for reducing a large number of measures to a smaller number called factors by discovering which measures go together, as well as the relationships between the clusters of measures. Discriminant validity is measured via pairwise correlation among constructs.

Convergent Validity

The factor model used in this analysis was a principal component analysis with varimax factor rotation on every observable construct. Factors extracted from factor analysis with loadings more than .45 were considered adequate for establishing convergent validity (Kim & Muellar, 1978).

Following the advice of Hair, Anderson, Tatham, and Black (1992), multiple criteria for the numbers of factors extracted were used: (a) latent root (eigenvalue) criterion should equal to one; (b) percentage of variance criterion requires that factoring procedure should not be stopped until extracted factors account for at least 60 percent of variance; and (c) the scree test suggests that the point at which the curve of the latent root first begin to straighten out is considered to indicate the maximum number of factors to

extract. Factor analysis results for major constructs are shown in Tables 6-11. (The number in the item designation refers to the position of the item as it appears in the questionnaire).

Table 6

Results of Factor Analysis for Environmental Turbulence^a

Item	Description	Factor loadings ^{b,c}		
		Factor 1	Factor 2	Communalities
ET5	Demand and consumer preferences are unpredictable	<u>.69*</u>	.20	.45
ET4	Actions of competitors are unpredictable	<u>.64*</u>	-.48*	.55
ET2	The rate at which new services are getting obsolete is very high	<u>.62*</u>	.17	.37
ET3	The service/product technology changes very frequently	<u>.60*</u>	-.44	.48
ET1	CU must change marketing practices frequently to keep up with market competitors	<u>.56*</u>	.42	.48
ET6	CU operates in an extremely risky environment	.44	.33	.28
ET8	CU's environment has many marketing opportunities	-.07	.59*	.25
ET9	CU's initiatives have very little influence on our environment	.30	-.53*	.24
ET7	CU's industry environment has many threats to the survival and well-being of the CU	.34	.44	.28
Eigenvalue		1.69	.88	
Variance explained		68.39	25.65	

Note. ^aN = 85. ^bRotated factor pattern using orthogonal VARIMAX rotation.

^cUnderlined items included in the factor.*Factor loading higher than .45.

Table 7

Results of Factor Analysis for Strategic Intent^a

Item	Description	Factor loadings ^{b,c}		Communalities
		Factor 1	Factor 2	
SI12	To increase the efficiency of equipment in use	<u>.79*</u>	.03	.61
SI13	To increase the use of employees' skills	<u>.79*</u>	.00	.60
SI6	To increase the members' satisfaction with the services offered	<u>.76*</u>	-.02	.56
SI5	To understand the market needs for consumer banking services	<u>.71*</u>	-.04	.64
SI9	To increase the speed of services	<u>.71*</u>	-.04	.51
SI7	To tailor the services to satisfy specific needs of the target market	<u>.70*</u>	.11	.48
SI4	To undertake innovations in offering services	<u>.59*</u>	.34	.59
SI3	To increase the quality of services offered	<u>.52*</u>	.22	.39
SI10	To set competitive prices/charges for services offered	<u>.49*</u>	.35	.49
SI11	To increase the overall productivity of the CU	.15	<u>.76*</u>	.50
SI1	To offer a wider range of services	-.04	<u>.68*</u>	.42
SI2	To achieve a high overall reputation in financial services industry	.07	<u>.65*</u>	.34
SI8	To minimize the possible uncertainties of the industry environment	.12	<u>.57*</u>	.40
Eigenvalue		4.07	1.15	
Variance explained		74.07	20.98	

Note. ^aN = 85. ^bRotated factor pattern using orthogonal VARIMAX rotation. ^cUnderlined items included in the factors. *Factor loading higher than .45.

Table 8

Results of Factor Analysis for Organizational Openness^a

Item	Description	Factor loadings ^{b,c}		Communalities
		Factor 1	Factor 2	
OP4	CU is always willing to get involved in joint tasks or projects with other credit unions if it improves performance	<u>.64*</u>	.18	.47
OP6	Top managers have many business contacts with top managers of other credit unions	<u>.63*</u>	-.35	.53
OP1	Exchanging information with other CUs is extremely important	<u>.56*</u>	.01	.31
OP2	Accepting advice or suggestions is an extremely important practice	<u>.47*</u>	.29	.32
OP3	Putting a lot of effort into becoming recognizable to as many potential customers as possible	.32	.38	.26
OP5	Involvement in the community is extremely important (contributions, supports, etc.)	.37	-.14	.19
OP7	Top managers have many business contacts with top managers in industries other than credit union	.33	-.33	.26
Eigenvalue		1.71	.53	
Variance explained		74.07	19.13	

Note. ^aN = 85. ^bRotated factor pattern using orthogonal VARIMAX rotation.

^cUnderlined items included in the factor. *Factor loading higher than .45.

Table 9

Results of Factor Analysis for Information Acquisition^a

Item	Description	Factor loadings ^{b,c}		Communalities
		Factor 1	Factor 2	
IA8	Commercial banks and thrifts are extremely important sources for learning new methods and services	<u>.65*</u>	-.14	.28
IA10	Joint tasks and mergers contribute a great deal of knowledge about industry and economic environment, new methods and services/products	<u>.61*</u>	-.06	.47
IA11	Top managers in any important decision seek information or advice from sources outside the CU	<u>.60*</u>	.19	.46
IA1	Members are an extremely important source of information about the market needs for consumer financial services	<u>.54*</u>	.13	.40
IA14	External sources are extremely important for the CU's operations	<u>.50*</u>	.24	.36
IA5	Reports from outside the CU industry are an extremely important source of information	<u>.47*</u>	.47*	.62
IA7	Other CUs are an extremely important source for learning methods and services	.43	-.14	.30
IA3	New business methods and services are always worth trying even if they may prove risky	.16	-.04	.21

Table 9 cont.

Results of Factor Analysis for Information Acquisition^a

Item	Description	Factor loadings ^{b,c}		Communalities
		Factor 1	Factor 2	
IA6	CU is always alert to any special reports and articles about CU industry	.07	<u>.62*</u>	.35
IA12	Top managers in any important decision seek information or advice from the board of directors	-.05	<u>.61*</u>	.23
IA2	Previous decisions are a useful source of information for current decisions	-.04	<u>.59*</u>	.29
IA4	Reports on the CU industry prepared by industry experts are an extremely important source of information	.38	<u>.50*</u>	.62
IA13	CU has employees whose job is related to searching for external information	.02	<u>.48*</u>	.35
IA9	Expertise on CU industry is an extremely important criterion for hiring a new employee	.10	-.35	.31
Eigenvalue		2.03	1.25	
Variance explained		50.83	23.10	

Note. ^aN = 85. ^bRotated factor pattern using orthogonal VARIMAX rotation.
^cUnderlined items included in the factors. *Factor loading higher than .45.

Table 10

Results of Factor Analysis for Information Interpretation^a

Item	Description	Factor loadings ^{b,c}		Communalities
		Factor 1	Factor 2	
II6	Special reports	<u>.71*</u>	-.08	.51
II4	Telephone contacts	<u>.70*</u>	-.02	.49
II5	Written memos	<u>.68*</u>	.26	.53
II7	Formal chain of command reporting	<u>.64*</u>	-.30	.50
II3	Committees as decision-makers	<u>.62*</u>	.21	.43
II2	Team meetings	<u>.46*</u>	.05	.19
III1	Personal contact	.07	.65*	.43
II8	More information to subordinate increases performance	.06	.63*	.41
III10	Information to subordinate must be simple and concise	-.01	-.63*	.32
II9	Information to subordinate must only contain the facts related to his/her job	.03	-.57*	.40
Eigenvalue		1.79	.90	
Variance explained		69.29	17.28	

Note. ^aN = 85. ^bRotated factor pattern using orthogonal VARIMAX rotation. ^cUnderlined items included in the factor. *Factor loading higher than .45.

Table 11

Results of Factor Analysis for Behavioral/Cognitive Changes^a

		Factor loadings ^{b,c}		
Item	Description	Factor 1	Factor 2	Communalities
Cognitive Changes Factor:				
BC10	Overall atmosphere	<u>.89*</u>	.04	.80
BC9	Satisfaction of the employees	<u>.87*</u>	.01	.75
BC11	Personal communication between top managers and employees	<u>.77*</u>	.23	.65
BC7	Average of productivity of employees	<u>.70*</u>	.31	.58
BC15	Efficiency of information systems within the CU	<u>.67*</u>	.31	.55
BC5	Speed of operations	<u>.63*</u>	.39	.55
BC14	Employees' level of understanding of major problems in the CU	<u>.56*</u>	.43	.50
BC13	Employees' level of understanding of CU's strategic orientation	<u>.50*</u>	.46*	.60
BC8	Turnover of employees	.33	.12	.12
Behavioral Changes Factor:				
BC6	Introduction of new marketing approaches	.24	<u>.72*</u>	.58
BC3	Number of services offered	.09	<u>.71*</u>	.51
BC12	Team meetings'efficiency	.33	<u>.64*</u>	.51
BC4	Technology of operations	.21	<u>.63*</u>	.43
BC1	Adaptability to environmental pressures	.04	<u>.52*</u>	.27
BC2	Quality of services	.41	<u>.45*</u>	.56
Eigenvalue		6.05	1.14	
Variance explained		71.20	13.41	

Note. ^aN = 85. ^bRotated factor pattern using orthogonal VARIMAX rotation.
^cUnderlined items included in the factors. *Factor loading higher than .45.

Factor analysis of the environmental turbulence construct extracted one factor that has an eigenvalue greater than one and explained 71.20 percent of variance. Based on examination of factor loadings on the items of environmental turbulence as suggested by Hair et al. (1992), environmental turbulence was interpreted as an unidimensional construct. The environmental turbulence factor (ENTUR) thus includes the following items: (a) changing the marketing practices to keep up with the competitors, (b) the high rate of service obsolescence, (c) very frequent changes of service/product technology, (d) demand and consumer preferences are unpredictable, and (e) actions of competitors are unpredictable.

Factor analysis of the strategic intent construct suggested the extraction of two factors that had eigenvalues greater than one and explained 74.07 and 20.98 percent of the variance respectively. After examination of the factor matrix and items related to factor loadings, the second factor was found uninterpretable because it contained heterogeneous items, thus suggesting that only one factor for strategic intent (INTENT) should be retained.

Strategic intent is defined as a sustained obsession to be the best at all levels of the organization. The extracted factor of strategic intent was indicated by nine items: (a) to increase the quality of services offered, (b) to undertake innovations in offering services, (c) to understand the market needs for consumer banking services, (d) to increase the

members' satisfaction with the services offered, (e) to tailor the services to satisfy specific needs of the target market, (f) to increase the speed of services, (g) to set competitive prices/charges for services offered, (h) to increase the efficiency of equipment in use, and (i) to increase the use of employees' skills.

Factor analysis of the items that tap organizational openness extracted one factor whose eigenvalue was greater than one. This factor, interpreted as organizational openness (ORGOPEN), alone explained 74.07 percent of the variance. The four items with factor loadings higher than .45 were: (a) exchanging information with other CUs, (b) accepting advice or suggestions, (c) CU's willingness to get involved in joint tasks or projects with other credit unions, and (d) top managers' contacts with other top managers of other credit unions.

Factor analysis on information acquisition extracted two underlying factors with eigenvalues greater than one. Those two factors explained 50.83 and 23.10 percent of the variance. The two factors were interpreted as non-industry specific information acquisition (NOINDSP) and industry specific information acquisition, which is the interpretation from the resource-based management theory notion of asset specificity (Reed & DeFillippi, 1990).

Non-industry specific information acquisition reflects the information sources that are not specific to the credit

union industry. The items that captured this dimension were: (a) members are important source for consumer financial services, (b) reports from outside the credit union industry are important source, (c) commercial banks and thrifts are important source, (d) joint tasks and mergers contribute a great deal of knowledge to credit union, (e) top managers in any important decision seek information or advice from sources outside the CU, and (f) external sources are extremely important.

The industry-specific information acquisition factor indicates the sources that are particularly specific to the credit union industry. The items that have loadings on this factor higher than .45 were: (a) previous credit union's decisions are important source of information, (b) reports on the CU industry are important, (c) CU is always alert to any special reports and articles about CU industry, (d) top managers in any important decision seek information or advice from the board of directors, and (e) CU has employees whose job is related to searching for external information.

Factor analysis of information interpretation indicated that information interpretation had only one factor with an eigenvalue greater than one. This factor consists only of the items that were intended to tap media richness and, was as such, interpreted as media richness (MEDRICH). The items that loaded significantly on this factor were: (a) team meetings, (b) committees as decision-makers, (c) telephone contacts, (d)

written memos, (e) special reports, and (f) formal chain of command.

Factor analysis of the behavioral/cognitive changes construct revealed two factors with eigenvalues greater than one and the cumulative variance explained greater than 80%. The first factor was interpreted as cognitive changes (COGNIT), and included the following items: (a) average productivity of employees, (b) satisfaction of the employees, (c) overall atmosphere, (d) personal communication, (e) employees' level of understanding of CU's strategic orientation, (f) employees' level of understanding major problems in the CU, and (g) efficiency of information systems within the CU. The second factor, interpreted as behavioral changes (BEHAVE), consisted of the following seven items: (a) adaptability to environmental changes, (b) quality of services, (c) number of services offered, (d) technology of operations, (e) introduction of new marketing approaches, and (f) team meetings' efficiency.

Discriminant Validity

The measures should not only have convergent validity, but also discriminant validity. Discriminant validity is the extent to which the measure is novel and not simply a reflection of some other construct or variable (Churchill, 1979). Discriminant validity is measured by pairwise correlations as suggested by Venkatraman (1989). High

correlations among the constructs might invalidate the tests, because high correlations might indicate that the scales measure the same rather than different constructs (Campbell & Fiske, 1959). Discriminant validity is indicated by low correlations between the measures of interest and other measures that are supposed to measure different constructs (Heeler & Ray, 1972; Venkatraman & Grant, 1986).

Specifically, discriminant validity is attained when the correlation of a variable with another variable does not exceed .55 and is significant at $p < .05$ (Schwab, 1980). Additional evidence of construct validity is provided when the pairwise correlations between the variables of interest have the direction assumed by the theory (Venkatraman, 1989).

Table 12

Variables: Means, Standard Deviations, and Pairwise Correlations^a

Variable ^b	Mean	SD	1	2	3	4	5	6	7
1 ENTUR	3.23	.61							
2 INTENT	4.16	.52	.08						
3 ORGOPEN	3.84	.58	.07	.22					
4 NOINDSP	3.53	.50	-.01	.36*	.46*				
5 INDSP	3.62	.51	-.25**	.12	.24*	.26*			
6 MEDRICH	3.53	.65	-.05	.24**	.13	.23**	.29*		
7 COGNIT	3.75	.64	-.13	-.12	-.11	.02	.12	.09	
8 BEHAVE	3.77	.53	.00	.30*	.28*	.43*	.29*	.29*	.39*

Note. ^aN = 85. ^bAll variables are summated scores of the items that were loaded on a particular factor. * $p < .01$ ** $p < .05$.

Table 12 indicates the results of pairwise correlations among variables of interest. The results indicate correlations among different variables for all variables lower than the cut-off value for correlation coefficient for the discriminant validity ($r=.55$). The highest correlation coefficient is .43 between the variable of behavioral changes and the variable of non-industry specific information acquisition ($p<.01$). In addition, most of the pairwise correlations (except for environmental turbulence) are positive as predicted by the theory, thus giving an additional evidence of construct validity (Venkatraman, 1989).

Reliability Assessment

The exploratory nature of this study, and the fact that the questionnaire on organizational learning used in our study has not been used in any previous studies, required an assessment of the extracted variables from factor analysis (Venkatraman & Grant, 1986).

Reliability is defined as the degree to which measures are free from error and therefore yield consistent results (Peter, 1979). Out of three basic methods for assessing reliability (test-retest, internal consistency, and alternative forms) the internal consistency method has the fewest limitations and is most often used in assessing reliability (Carmines & Zeller, 1979; Venkatraman, 1989).

Following the recommendations of Churchill (1979) and

Nunnally (1967, 1978), Cronbach's alpha (α) was computed for all factors that were to be used as variables in hypothesis testing. Researchers usually use a cut-off value of $\alpha = .70$ (α_1) for studies in advanced phases (Nunnally, 1978), while for exploratory studies alphas ranging from .50 to .60 (α_2) are considered to be sufficient (Nunnally, 1967; Van de Ven & Ferry, 1979).

The values of Cronbach's alphas for all variables (along with variable designations and numbers of items) are shown in Table 13.

Table 13

Summary of Variables, their Designations, and Cronbach's Alphas

Variable	Designation	Number of items	Cronbach's alpha
Environmental Turbulence	ENTUR	5	.695
Strategic Intent	INTENT	9	.858
Organizational Openness	ORGOPEN	4	.676
Non-industry Specific Information Acquisition	NOINDSP	6	.657
Industry Specific Information Acquisition	INDSPEC	5	.624
Media Richness	MEDRICH	6	.743
Cognitive Changes	COGNIT	8	.892
Behavioral Changes	BEHAVE	6	.756

The assessment of reliability for the variables of interest show that all variables met the α_2 criterion, while four variables met the even more stronger α_1 criterion.

To summarize, at the beginning of this chapter, it was indicated that measures have to meet validity and reliability conditions in order to be considered good measures and to be used in hypothesis testing. As shown above, both, construct validity (via factor analysis and pairwise correlations) and reliability analysis indicate moderate-to high levels of validity and reliability.¹

¹An alternative approach for assessing construct validity and reliability is first to assesses reliability of the scale that purports to measure a particular construct, and second to assess construct validity of the constructs. Such an approach requires scale purification by excluding all the items with item-to-total correlations lower than .30 (Nunnally, 1978). The purified scales are then considered to be "externally valid."

The alternative approach applied in this study virtually duplicated the results of the original approach. The scale purification excluded all of the items that were not loaded on the extracted factors via factor analysis. Differences between the approaches occurred for the information acquisition construct (purified scale excluded two items more that were loaded significantly on the two factors), and the behavioral/cognitive changes construct (the purification process excluded one item more than in the original approach).

Hypothesis Testing

Discussion of Testing Technique

The methodology chosen in strategic management research depends on the types of variables, types of dependency, number of dependent and independent variables, and other attributes that are required by a particular technique.

The variables of main effects in our research are metric and nominal for organizational learning constructs and ratio for organizational performance measures and some controlling variables. The theoretical model presented in the chapter clearly suggests numerous dependent variables. Such a model suggests the use of three possible techniques: structural equation modelling, canonical analysis, and multiple regression (Emory & Cooper, 1991). Each of these techniques requires particular assumptions that have to be met in order for the technique to be valid.

The structural equation modeling technique was not used due to the small sample size. The minimum sample should have at least 100 observations (Hair et al., 1992), while the recommended sample size has to have 200 observations (Miner, 1982). Preliminary attempts to use structural equation modelling revealed severe problems of model identification (very large standard errors for coefficients, inability to invert the information matrix, and in some cases negative error variances/Heywood case).

Canonical analysis is a technique for exploring the

relationships among multiple criterion and multiple predictor variables. The technique is more general than any other multivariate techniques (i.e. regression analysis or MANOVA), but, has several limitations that discourages researchers from using it: (a) the technique is mostly descriptive and as such has limited predictive validity of assumed relationships; (b) it reflects the variance shared by the linear composites of the sets of variables, and not the variance extracted from the variables; (c) canonical weights derived in computing canonical functions are subject to a great deal of instability; (d) canonical weights are derived to maximize the correlation between linear composites, and not the variance extracted; and finally, (e) it is difficult to identify meaningful relationships between the subsets of dependent and independent variables because precise statistics have not been developed yet (Hair et al., 1992).

The limitations of the previously mentioned techniques imply the use of multivariate regression analysis. This technique requires the use of one single criterion variable and one or several independent variables. The objective of this technique is to use independent variables with known values to predict a single dependent variable. This technique requires three crucial assumptions to be met in order for this technique to be valid: (a) normality of variables, (b) homoscedasticity, and (c) non-existence of multicollinearity among independent variables. The methodologists have

developed numerous techniques for assessing the character of assumptions and also technique in the cases when assumptions are not met.

Before applying regression technique to our data, several diagnostics were performed. First, the relationship between each dependent variable that represents information acquisition and information interpretation and each independent variable was performed via partial regression plots in order to determine the type of relationship (linearity test). Second, the identification of possible outliers was performed in order to identify possible influential observation via residual analysis. Third, the normality of the variables was inspected via analysis of distribution shapes of variables and Shapiro-Wilk's test of normality (see Table 14).

All regression equations were also tested for multicollinearity via tests of tolerance value and variance inflation factor (see Appendix G). The possible existence of heteroscedasticity was tested by a test of first and second moment specification (White, 1980).

Table 14

Shape, Normality Test, and Suggested Transformation of the Variables of Interest

Variable	Shape		Normality test		Suggested transformation ^a
	Skew.	Kurt.	Statistic	Sign.	
ENTUR	-.366	.569	.975	.353	
INTENT	-1.600	7.596	.898	.000	Logarithm
ORGOPEN	-.239	-.723	.947	.004	
NOINDSP	-.317	.249	.970	.188	
INDSPEC	-.124	-.407	.963	.062	
COGNIT	-.370	.580	.972	.250	
BEHAVE	.407	-.331	.959	.040	

Note. ^aTransformation suggested by Hair et al. (1992)

Results of Hypothesis Testing

Results of Testing Hypotheses 1-4

Hypotheses 1-4 were tested simultaneously since all the predictors (environmental turbulence, strategic intent, organizational openness, and interaction effects) share the same criterion variables. It was hypothesized that environmental turbulence, strategic intent, organizational openness, and interaction effects would have positive relationships with information acquisition and information interpretation.

The hypotheses were tested by using the multiple regression models. The dependent variables were NOINDSP, INDSPEC, and MEDRICH. The models were first tested by using linear and then transformed variables. In all cases, equations with linear variables provided better results that are reported in Table 15. In the second stage, the nonadditive regression equations were tested by introducing multiplicative terms (two-stage hierarchical regression) that explore the joint effects of environmental turbulence and internal factors on dependent variables.

Two-stage hierarchical regression is suggested in the literature to test the combined effects of independent variables on dependent variables (Allison, 1978; Blalock, 1965). The use of multiplicative terms in regression analysis might invoke some concerns over the effects of multicollinearity between interaction terms and their

component variables (Dewar & Werbel, 1979; Drazin & Van de Ven, 1985). The mathematical arguments (Arnold, 1982; Cohen, 1978), and simulations (Stone & Hollenbeck, 1984) have indicated that F-tests for increments in R^2 in hierarchical regressions for multiplicative terms are valid even when the terms are highly correlated with the component variables for nonratio variable (in our case interval variables). However, despite the fact that F-tests are valid, coefficients of component variables and their multiplicative terms cannot be interpreted separately, since both coefficients - for interaction terms and main effects - contain the information that is needed to interpret "N-way" interaction (Cohen & Cohen, 1975).

Table 15

Results of Regression Analysis for Testing Hypotheses 1-4^a

Equation	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	NOINDSP		INDSPEC		MEDRICH	
ENTUR	-.03	-.60	-.23*	-1.82**	-.11	-2.10***
INTENT	.21*	-.50	.06	-1.32	.26**	-1.13***
ORGOPEN	.34*	.69	.22*	.48	.14	.03
ENTUR*INTENT		.24		.47**		.46
ENTUR*ORGOPEN		-.12		-.10		.01
CONSTANT	1.43**	3.13	3.22*	8.10**	2.23*	8.46**
F-STAT	9.93*	6.42*	4.22*	3.67*	2.11***	1.87***
R ²	.28	.30	.14	.19	.07	.11

Note. ^aN = 85. *p<.01.**p<.05. ***p<.10.

The additive regression model for NOINDSP as dependent variable explained 28 percent of the variance in NOINDSP ($p < .01$) and the equation with multiplicative terms explained 30 percent of the variance in NOINDSP ($p < .01$). In the first equation, the coefficients for strategic intent (INTENT) and organizational openness (ORGOPEN) were significant with expected signs (all $p < .01$). In the nonadditive models, none of the coefficients for NOINDSP as dependent variable was found to be statistically significant. In sum, the introduction of the interactive effects did not improve the overall regression model for NOINDSP as dependent variable.

The regression analysis for INDSPEC as dependent variable for additive and nonadditive terms, explained 14 and 19 percent of the variance in INDSPEC, respectively ($p < .01$). In the first equation, the coefficients for environmental turbulence (with negative sign) and organizational openness (with positive sign) were significant ($p < .01$). In the second equation, the coefficients for environmental turbulence ($p < .05$) and the interaction effect between environmental turbulence and strategic intent ($p < .05$) were statistically significant. The nonadditive models showed lower overall level of significance compared to the additive model.

The regression equations for MEDRICH as dependent variables explained seven and 11 percent of the variance in MEDRICH (both $p < .10$), respectively. In the first equation, the coefficient for strategic intent was found significant and

with expected positive sign. The second equation that included interactive terms revealed two significant coefficients for environmental turbulence and strategic intent, both with negative signs ($p < .05$). The summary of significant relationships for all tested relationships in hypotheses 1-4 is shown in Table 16.

Table 16

Summary of Significant Relationships for Hypotheses 1-4

Dependent variable	NOINDSP	INDSPEC	MEDRICH
Hypothesis/ Independent variable			
Hypothesis 1:			
ENTUR		S	S
Hypothesis 2:			
INTENT	SE	S	SE
Hypothesis 3:			
ORGOPEN	SE	SE	
Hypothesis 4:			
ENTUR*INTENT		SE	
ENTUR*ORGOPEN			

Note. S - significant. SE - significant with expected sign.

To summarize, the regression analysis does not provide support for Hypothesis 1 (the relationship between environmental turbulence and the organizational learning process), does provide support for Hypothesis 2 (the relationship between strategic intent and organizational learning process) and Hypothesis 3 (the relationship between organizational openness and the organizational learning process), and partially supports Hypothesis 4: (a) support for H4.1 (the relationship between joint effect of environmental turbulence and strategic intent and the organizational learning process), (b) no support for H4.2 (the relationship between joint effect of environmental turbulence and organizational openness and the organizational learning process).

Results of Testing Hypothesis 5

In Hypothesis 5, we hypothesized that information acquisition and information interpretation would have a positive relationship with behavioral and cognitive changes in an organization.

This hypothesis was tested with ordinary least squares (OLS) regression where the dependent variables were cognitive changes (COGNIT), and behavioral changes (BEHAVE) (see Table 17). Independent variables in this set of regression equations were non-industry specific information acquisition

(NOINDSP), industry-specific information acquisition (INDSPEC), and media richness (MEDRICH).

Table 17

Results of Regression Analysis for Testing Hypothesis 5^a

Equation Dependent variable	(1) COGNIT	(2) BEHAVE
Independent variable		
NOINDSP	.11	.38*
INDSPEC	.18	.17***
MEDRICH	.11	.13***
CONSTANT	2.31**	1.33**
F-STAT	1.89***	8.62*
R ²	.06	.25

Note. ^aN = 85. *p<.01.**p<.05.***p<.10.

The regression analysis showed significant F-tests for BEHAVE as dependent variable that explained 25 percent of its variance (p<.01). The equation with COGNIT as dependent variable was significant only at a .90 level of confidence, explaining only six percent of the variance in the dependent variable.

The coefficients for NOINDSP, INDSPEC, and MEDRICH were statistically significant only in equation with BEHAVE as dependent variable, all with expected positive signs.

As the results in Table 17 indicate, the hypothesized relationship between information acquisition and information interpretation, and behavioral/cognitive changes (H5) is only partially significant.

Results of Testing Hypothesis 6

In Hypothesis 6, it was hypothesized that behavioral and cognitive changes would have a positive relationship with organizational performance.

The hypothesis was tested in two ways: first, by using OLS regression to determine the significance of the relationship between behavioral/cognitive changes and organizational performance; and second, by LOGIT regression to determine the accuracy of classification of organizational performance based on the organizational learning (competitive advantage test).

OLS regression was performed in three consecutive steps: (a) in the first step only independent variables for main effects were used in equations; (b) in the second step the following controlling variables were added: size (ASSET), number of years of CEOs in the office (CEOY), total amount of hours put into education of employees (TH), total amount of spent in training and education (TAM), number of years of existence of credit union (YEARS), and market share of a credit union on the local market (SHARE); (c) in the third step dummy variables for type of credit union (TYPED), type of

charter (CHARTD), and location (LOCATD) were added into the set of independent variables. All three steps were then repeated for all organizational learning variables (alternative model).

The degrees of freedom limitations prevented the use of all independent variables at the same time, thus sequential approach of adding the sets of variables was used. Independent variables used for testing this hypothesis were based on the responses on the questionnaire and on Ferguson and Company's database of credit unions.

Two dependent variables were used: (a) capital-to-total assets ratio (CTA); and (b) aggregated index of performance (INDEX). The capital-to-asset ratio was chosen for two reasons: first, this is the most comprehensive ratio of the credit unions' performance and is usually defined as the "profitability" ratio; and second, CEOs and credit union managers recognized the capital-to-asset ratio as the most important single measure of organizational performance in our questionnaire. Capital-to-total asset ratios were used as reported in Ferguson and Company's database of credit unions. Index of performance represents the composite index of single measures of performance of credit unions and is computed by summing CEOs' satisfaction with organizational performance

of credit unions with their measures ranking as weights (Gupta & Govindarajan, 1984).²

The shapes, normality tests, and suggested transformations of controlling and dependent variables for testing Hypothesis 6 are shown in Table 18, and the results of OLS regression analysis for Hypothesis 6 are shown in Tables 19 and 20.

²The availability of objective and self-reported data for capital-to-asset ratio enabled us to test for self-report accuracy. The correlation between self-reported and objective data was found to be .92 which is substantially higher than the level of accuracy reported in a similar study (McShane, 1986).

Table 18

Shape, Normality Test, and Suggested Transformation of
the Variables of Interest in Testing Hypothesis 6

Variable	Shape		Normality test		Suggested transformation ^a
	Skew.	Kurt.	Statistic	Sign.	
ASSET	4.229	25.412	.628	.000	Logarithm
MEMBER	3.215	12.897	.648	.000	Logarithm ^b
CEOY	.986	.683	.907	.000	
FTE	3.416	15.103	.627	.000	Logarithm ^b
TH	3.921	18.335	.554	.000	Logarithm
TAM	6.507	45.160	.282	.000	Logarithm ^c
YEARS	-.080	-.955	.928	.000	
SHARE	3.675	14.062	.463	.000	Logarithm ^d
CTA	4.325	25.546	.648	.000	Logarithm
INDEX	.702	.429	.956	.064	Logarithm ^e

Note. ^aTransformation suggested by Hair et al. (1992). The transformed variable was retained in the estimated equations only if it showed better results compared to linear variable. ^bMEMBER and FTE showed high level of multicollinearity with ASSET in estimated equation and were eliminated from estimation procedure. ^cTAM variable showed high multicollinearity with TH and was eliminated from estimation procedure. ^dSHARE represents the market share of a credit union on the local financial market in terms of asset size. Data for commercial banks were drawn from BankSource Database and data for credit unions were found in Ferguson and Company Credit Union database. In a case where commercial bank did not have a headquarters in a particular city, we had to estimate the total amount of assets in the city by multiplying average asset per person in Ohio with total population in the city. The data for population were found in 1990 Census Database.

Table 19

Results of Regression Analysis for Testing Hypothesis 6
(Original Model)^a

Dependent variable	CTA			INDEX		
	(1)	(2)	(3)	(4)	(5)	(6)
Equation Independent variable						
COGNIT	.72	1.13	1.02	2.85*	3.68*	2.84*
BEHAVE	-1.88	-2.69	-2.12	1.36	2.52**	1.25
ASSET		-.01			-.00	
CEOY		.14			.11	
YEARS		-.02			-.03	
TH		-.00			-.01	
SHARE		-.01			.01	
TYPED ^b			.49			-.33
CHARTD ^c			-1.03			.42
LOCATD ^d			-.90			.40
CONSTANT	13.81***	14.84	13.62	-1.27	-8.50**	-.65
F-TEST	.84	.75	.72	15.67*	7.32*	6.22*
R ²	.03	.09	.10	.35	.60	.36

Note. ^aN = 85. ^bDummy variable for the type of a credit union (occupational = 1; other = 0). ^cDummy variable for type of charter of a credit union (federal = 1; other = 0). ^dDummy variable for the location of a credit union (urban = 1; other = 0). *p<.01. **p<.05. ***p<.10.

Table 20

Results of Regression Analysis for Testing Hypothesis 6
(Alternative Model)^a

Dependent variable	CTA			INDEX		
Equation Independent variable	(1)	(2)	(3)	(4)	(5)	(6)
COGNIT	.53	.70	.65	2.54*	2.74*	2.48*
BEHAVE	-2.91**	-3.35**	-2.95***	.81	.80	.92
NOINDSP	1.59	1.37	.95	-1.18	-.76	-1.18
INDSPEC	2.03***	2.63***	2.13	1.78*	2.35*	1.77
MEDRICH	-.07	-.13	.48	1.55*	1.19*	1.57
ASSET		.00			.00	
CEOY		.12			.06	
YEARS		-.08			-.05	
TH		-.01			-.02	
SHARE		-.02			.00	
TYPED ^b			.64			.01
CHARTD ^c			-1.29			-.20
LOCATD ^d			-.64			.24
CONSTANT	5.88	8.16	5.63	-5.66	-7.36***	-5.67
F-TEST	1.07	.87	.81	10.19*	5.84*	6.06*
R ²	.10	.16	.13	.49	.55	.49

Note. ^aN = 85. ^bDummy variable for the type of a credit union (occupational = 1; other = 0). ^cDummy variable for type of charter of a credit union (federal = 1; other = 0). ^dDummy variable for the location of a credit union (urban = 1; other = 0). *p<.01. **p<.05. ***p<.10.

Equations for CTA as dependent variable showed low levels of significance with R^2 ranging from .03 to .09 in the original model, and from .10 to .16 in the alternative model. The inclusion of controlling variables improved the overall R^2 . However, none of the coefficients for controlling variables was found statistically significant. The coefficients in the alternative models were significant for variables BEHAVE ($p < .05$) and INDSPEC ($p < .10$).

Regression models with INDEX as a dependent variable showed high levels of significance (all $p < .01$) having R^2 ranging from .35 to .60 in the original model and from .45 to .55 in the alternative model. Again, all the controlling variables contributed to the improvement of the overall model fit but were not significant. The coefficients for main effect variables showed the following results: (a) for variable COGNIT coefficients were statistically significant in all six equations with expected (positive) sign ($p < .01$); (b) for variable BEHAVE the coefficient was significant in one equation with expected sign ($p < .05$); (c) the coefficients for variable INDSPEC and MEDRICH were statistically significant in two equations, both with positive signs.

The overall conclusion from the regression analysis provides a moderate support for Hypothesis 6.

Results of LOGIT Regression for Hypothesis 6 (Competitive advantage test)

Testing Hypothesis 6 with LOGIT regression (competitive advantage test) required a division of credit unions into two groups based on the median split of their performance. Credit unions with performance above the median (for both CTA and INDEX) were assigned a value of one and those below the median were assigned a value of zero. A dichotomous predictor variable was used to assess whether organizational learning had a positive and significant role for organizational performance.

In cases where the predictor variable is dichotomous, the OLS linear regression model is not appropriate. Instead, three alternative statistical techniques: PROBIT, LOGIT, and multiple discriminant analysis can be used (Doyle, 1977). As is reported by Moore and Reichert (1989), PROBIT and LOGIT yield nearly indistinguishable results. Comparison of LOGIT analysis and multiple discriminant analysis usually favors the use of LOGIT analysis for the following reasons: (a) discriminant analysis relies strictly on meeting the assumptions of multivariate normality and equal variance, of which the first is not met in our case; (b) even if the assumptions are met, one prefers the LOGIT analysis due to its similarity to OLS regression, its straightforward statistical tests, ability to incorporate nonlinear effects, and wide

range of diagnostics (Hair et al., 1992). Given these reasons, LOGIT analysis was chosen for testing Hypothesis 6.

LOGIT analysis was used for testing two models: first, for behavioral and cognitive changes as independent variables; and second, for the model that includes not only behavioral and cognitive changes but also variables of information acquisition and media richness. Both models are estimated by using maximum likelihood estimation techniques. This technique gives various tests: (a) -2 Log Likelihood statistic (-2LL) which is the likelihood ratio chi-squared test statistic for testing the joint significance of the explanatory variables included in the model, (b) Akaike Information Criterion (AIC), and Schwartz Criterion (SC) that are both the likelihood ratio chi-squared test statistics for testing the joint significance of the explanatory variables and intercept included in the model.

LOGIT analysis also tests the hypothesis that a coefficient is different from zero by using Wald statistic whose interpretation is similar to one of the t-tests in multiple regression analysis. In addition, the LOGIT model allows for accuracy of classification of the observations into two groups. Thus, the model can be used to forecast the probability that any given credit union will perform above the median or below the median of organizational performance. The predicted probability for a credit union is compared with .50, which represents the equal chance criterion. Overall accuracy

of classification should be assessed relative to the percent correctly classified by chance (Morrison, 1969). For our model the chance proportion benchmark is 50.1 percent based on the computation given by the chance proportion formula (Moore & Reichert, 1989). The results of LOGIT analysis are given in Tables 21 and 22.

Table 21

Results of LOGIT Regression Analysis (CTA)

	2-variable model	5-variable model
AIC	108.83	109.86
SC	116.06	124.15
-2LL	102.84	97.86
Chi-Sq	1.08 (p=.58)	4.43 (p=.48)
% of cases correctly classified	56.40	65.80
CONSTANT	-1.05	1.55
COGNIT	-.01	.15
BEHAVE	.48	.84***
NOINDSP		-.50
INDSPEC		-.62
MEDRICH		-.17

Note. *p<.01. **p<.05. ***p<.10.

Table 22

Results of LOGIT Regression Analysis (INDEX)

	2-variable model	5-variable model
AIC	108.05	110.54
SC	115.27	124.84
-2LL	102.05	98.54
Chi-Sq	5.65 (p=.19)	7.30 (p=.05)
% of cases correctly classified	64.90	72.40
CONSTANT	4.46***	4.71***
COGNIT	-.73	-.60
BEHAVE	-.29	-.29
NOINDSP		.26
INDSPEC		.14***
MEDRICH		-.62

Note. *p<.01. **p<.05. ***p<.10.

The LOGIT analysis for CTA as the dependent variable showed a moderate level of overall significance with significant coefficients for variable BEHAVE with positive expected sign in the 5-variable model. The cases were correctly classified in 56.40 percent of the time in the 2-variable model and in 65.80 percent of the time in the 5-variable model.

The LOGIT analysis for INDEX as dependent variable showed a higher level of goodness of fit compared to the CTA model ($p=.05$), and with significant coefficients for the variable INDSPEC with positive expected sign. The cases were correctly classified 64.90 percent of the time in the 2-variable model, and 72.40 percent of the time in the 5-variable model.

In sum, the overall statistics and the accuracy of classification (for both dependent variables) provide support for Hypothesis 6 for a positive relationship between organizational learning and organizational performance.

CHAPTER VII

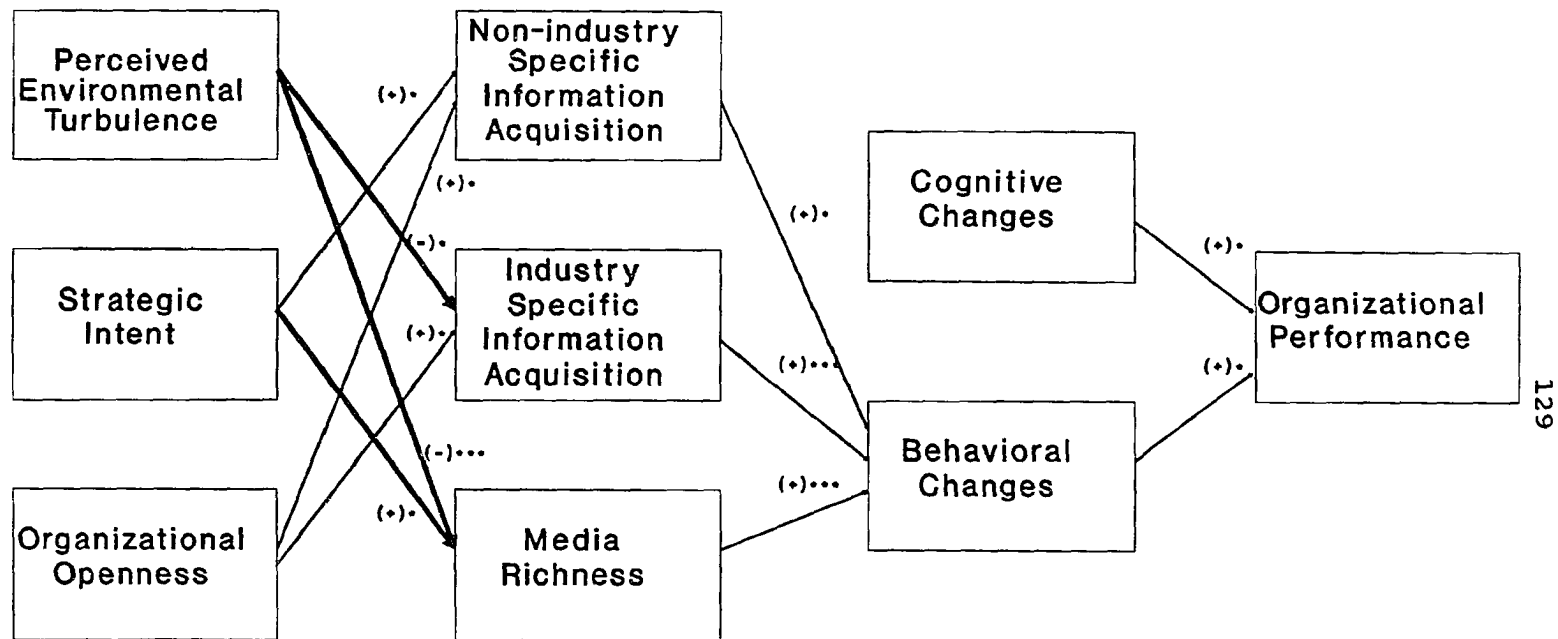
DISCUSSION AND CONCLUSIONS

This dissertation addressed two research questions dealing with (1) the determinants of organizational learning (environmental turbulence, strategic intent, and organizational openness), and (2) the relationship between organizational learning (process and outcomes) and organizational performance.

Summary

Figure 5 summarizes the results of this study by indicating which relationships in our model (see Figure 3, p.55) were found to be significant, and the direction of these relationships. The study suggests that environmental turbulence, strategic intent, and organizational openness represent the organizational learning determinants. The relationships between the organizational learning process and outcomes is significant only for behavioral changes. Finally, both, cognitive and behavioral changes, are conducive for organizational performance.

Figure 5. Summary of significant relationships in the model



Note. \cdot $p < .01$. $\cdot\cdot$ $p < .05$. $\cdot\cdot\cdot$ $p < .10$.

Discussion of the Research Results

The research model of organizational learning built in this dissertation is based on the theoretical findings of the literature on organizational learning (Fiol & Lyles, 1985; Huber, 1991) as well as on the strategic management literature (Barney, 1989; Porter, 1980; Reed & DeFillippi, 1990). The organizational learning process, it was argued, is a process that is determined by the internal and external factors and their interactions (Hrebiniak & Joyce, 1985). The process itself is composed of numerous different types of learning that result in behavioral and cognitive changes (Argyris & Schon, 1978; Crossan, 1991; Garvin, 1993). Organizational learning affects organizational performance and possibly leads to competitive advantage.

The findings of this study give empirical support to prior research showing that both internal and external factors are conducive to organizational learning, and that organizational learning implies behavioral and cognitive changes that subsequently lead to improvement in organizational performance. However, the results also expand prior understanding of the way in which organizational learning is structured.

Determinants of Organizational Learning

The hypothesis testing of the relationships between determinants and the organizational learning process provides

support for a relationship between strategic intent and organizational learning (H2), and between organizational openness and organizational learning (H3). However, there is only partial support for the hypothesis of the relationship between joint effects of internal and external factors and organizational learning (H4), while no support exists for the hypothesis of the relationship between environmental turbulence and organizational learning (H1).

These results imply that the theoretically assumed constructs - environmental turbulence, strategic intent, and organizational openness - represent important determinants of the organizational learning process.

Environmental Turbulence

The negative relationship between perceived environmental turbulence and industry-specific information acquisition is opposite to the theoretical discussions that expect that environmental turbulence would increase the information processing. This contradiction between empirical findings and theoretical expectations may infer two possible explanations: (a) the relationship between perceived environmental turbulence and the organizational learning process might be curvilinear; and (b) the extremely high perceived environmental turbulence might lead to an information overload because organizations, due to insufficient information processing capacities, might be

unable to process all the incoming information (Huber, 1991; Meier, 1963).

Empirical testing of the first explanation would require multi-industry research design. The second explanation is characteristic for environments with extremely high growth rates (Day, 1977; Glazer, 1990), which is, in fact, true for the credit union industry. The perception of extremely high environmental turbulence may be due to the fact that CEOs have to respond quickly to environmental changes in order to stay competitive. Such an explanation implies that organizations do not have enough time to "react" to organizational changes and, are, thus, unable to complete the learning cycle (March & Olsen, 1975) (see Figure 2, p.33).

Strategic Intent

The dynamic nature of the financial service industries requires a high level of proactiveness by credit unions and strategic focus in order to survive and satisfy the customer over the long term. The strategic intent construct reflects the willingness of credit unions to be proactive in organizational learning and their strategic focus (Hamel & Prahalad, 1989; Lado, 1992). The empirical results in this study generally support the theoretical discussion on strategic intent and suggest that those organizations that are more strategically focus would have a high tendency to information acquisition and information interpretation. Given

the fact that the empirical analysis was done for a particular industry, the results are more specific and conclusive than merely theoretical considerations.

The significant relationship between strategic intent and non-industry specific information acquisition reveals the notion that credit unions perceive that their survival depends more on their competitiveness relative to commercial banks and thrifts than on their competitiveness versus other credit unions. The credit unions' concern with competitors in other non-credit union financial industries is further supported by a significant relationship between joint effect between environmental turbulence and strategic intent and organizational learning process (H4.1).

Organizational Openness

With respect to organizational learning, our results support Hypothesis 3. The credit unions in this sample that are high in organizational openness seem to have a higher tendency towards information acquisition and information interpretation. The findings in this study support (a) the previous research on the relationship between organizational openness and organizational learning process, which suggest that high level of organizational openness instigates information acquisition through high level of interaction with other organizations and environment (Hamel, 1991), and (b) the learning organization approach, which suggests that

organizations, in order to improve quality, enhance relations with customers and suppliers, and more effectively implement strategy, must possess the ability to continuously learn and high level of openness to the environment (Senge, 1990).

However, the results of this study refine the previous research by suggesting that organizational openness may instigate information acquisition rather than interpretation. Although the research design and the exploratory nature of the study may preclude any definite conclusions, the significance of the relationship between organizational openness and organizational learning process might imply that credit unions focus primarily on the activities how to get the information from various sources, thus trying to reduce uncertainty, rather than how to interpret the information, and thus reducing equivocality (Daft & Lengel, 1986). The inclination towards information acquisition over information interpretation implies that credit unions might value information quantity higher than information quality, which is, in fact, contradictory to the theory on information value (Rockart, 1979; Shannon & Weaver, 1973; Taylor, 1986) and to the literature on parentetic learning (Klein, 1989).

Process and Outcomes of Organizational Learning

Having lower research funds available compared to commercial banks, credit unions seem to be very conscientious about the costs of organizational learning, thus, they prefer

to use second-hand learning (benchmarking, competitor's intelligence, and industry CEOs networking) to direct learning.

The relationship between the organizational learning process and outcomes shows that behavioral changes are more likely than cognitive changes. Positioning the credit union industry's organizational learning into the change/no change matrix of behavioral and cognitive changes reveals that the credit union industry probably falls into a quadrant B (see Figure 4, p.65). As Fiol and Lyles argue, such a situation is typical for organizations that keep taking actions, changing strategies, and restructuring (Fiol & Lyles, 1985). The organizations that are positioned in a quadrant B typically have high strategic intent (which is supported by our study) and operate in an unpredictable environment (also supported by our study). This result might reflect the credit unions' constant alertness to new methods, techniques, and practices which they try to adopt and implement. This finding also further supports our previous finding that credit unions learn primarily through second-hand learning rather than through direct learning and experimentation (Reed & Fillippi, 1990; Rumelt, 1984).

The significance of the relationship between organizational learning process and behavioral changes can also be given another theoretical explanation. In Crossan's change/no change matrix (see Figure 1, p.30), the findings

might imply that the credit unions' type of organizational learning falls between forced learning, where individuals employ their current beliefs to change their behavior, and anticipatory learning, which expresses a time lag between individuals' experience of cognitive and behavioral changes (Crossan, 1991). The forced learning is probably based on changes in the environment and subsequently on environmental adjustments. Although the cross-sectional nature of our data preclude more precise testing for the existence of anticipatory learning, the results might indicate that credit unions - based on their strategic intent - try to foresee the future trends and developments of financial service industries and try to prepare their employees to adequately cope with them. Such an explanation is consistent with the previously discussed findings on the strategic intent and proactiveness of credit unions.

The occurrence of the significance of behavioral changes in empirical testing might suggest that credit union primarily change their behavioral patterns within the existing underlying norms, policies, and objectives. Although inconclusive, this study might suggest that credit unions are more inclined towards single-loop than to double-loop learning (Argyris & Schon, 1978). This explanation is consistent with the previous findings that suggested that second-hand learning might be a primary way of organizational learning in the credit union industry.

Organizational Learning and Performance

The effect of behavioral and cognitive changes on organizational performance is considered to be a final stage of organizational learning (Garvin, 1993). This relationship is significant and positive for INDEX as the dependent variable in three equations for cognitive changes and in one equation for behavioral changes. Generally, such a result might indicate that credit unions share some characteristics of "learning organizations" (Senge, 1992), seeking an increase in customer satisfaction and attracting new potential members.

Although, it was suggested that organizational learning outcomes in the credit union industry might be primarily behavioral changes and use of a single-loop learning, the higher level of significance for cognitive changes clearly suggest that primary source of the competitive advantage are cognitive changes and the use of double-loop learning. Such an interpretation might imply that behavioral change might affect organizational performance, however, only cognitive changes or higher-level of organizational can infer sustainable competitive advantage, which is the conclusion that support Fiol and Lyles' theoretical discussion on lower and higher-level learning (Fiol & Lyles, 1985).

The lack of significance of the coefficients for controlling variables implies that organizational learning is not limited to any size, type, charter, location, years of existence, or market share of credit unions. These findings

support those previous empirical studies that did not find these variables to be significant in accounting for the variance in organizational performance of credit unions (i.e. Cox & Whigham, 1984). Given the fact that the results in this study hold over a large range of different variables, it might be inferred that basic results are quite robust.

It might also be implied from these results that credit unions tend to substitute the disadvantages they have in "hard" factors of success (capital) relative to other financial industry competitors with "soft" factors of success (such as organizational learning). High industry growth in the last few years with relatively low capital investments might also support such an assertion. The results of LOGIT analysis further support the importance of organizational learning to performance. Thus organizational learning might be considered as an important source of competitive advantage for credit unions.

Limitations of the Study and Future Research

Limitations of the Theoretical Framework

The theoretical framework views an organization as institutionalized brains (Morgan, 1986). This view assumes that organizations acquire, process, interpret, and distribute information about the external environment and internal capabilities. Despite the fact that this approach showed affirmative results and might represent an accurate and broad

theoretical foundation for developing a model of a multifaceted construct of organizational learning, it also limits the organization by reducing it primarily to an information processing entity. This view might be too narrow to explain all the possible diversities of the organizational environment and activities, and as such has its limitations both in theory and practical applications.

The strategic management literature has so far given no rigorous explanation of organizational learning as an "isolating mechanism" (Mahoney, 1992) or as a source of competitive advantage (Garvin, 1993). The fact that organizational learning has been developed as a construct of the organizational behavior and psychology field might also be a reason that research on organizational learning has been focused particularly on "precepts" (Crossan, 1991) that have no particular relevance for the strategic management field (i.e. whether organizational learning is a summation of individual learning).

One of the intentions of this study was to develop the relationships among the "core" strategic constructs that would explain organizational learning as a strategically relevant category. Although the theoretical framework developed in this study has contributed to the understanding of the organizational learning phenomenon and the relationships among relevant constructs, the framework is still static and preliminary. The primary reason for a static approach was the

need for rigor and clear theoretical relationships among the major constructs. However, the inherently evolutionary nature of organizational learning requires a more dynamic approach that would require inclusion of time paths into the theoretical model (Nelson & Winter, 1982; Teece, Pisano, & Shuen, 1990).

Limitations of the Methodology

The sample used in this study was drawn from the credit unions in Ohio. Despite the fact that the size structure of the credit unions in Ohio matches that of the U.S., one should be careful in generalizing the results of this study. Credit unions - as shown as a part of this study - are driven by customer needs and inter-industry competitiveness. Such a competitive configuration might force credit unions in other parts of the U.S. with different industry and local economic characteristics to develop different patterns of organizational learning.

The limitations of the sample size also prevent the use of second generation multivariate methodologies (i.e. LISREL) that would test the fit of the whole theoretical model.

This study primarily relies on the perceptual data provided by a single informant for organizational learning (CEO or general manager). Despite the fact that CEOs or general managers are the most informed persons in credit unions, they may have their perceptual biases or cognitive

distortions. The high correlation between objective data (on organizational performance) and subjective self-reported data on the same variable encourages a confidence in the accuracy of the data reported and adds to the validity of our results (McShane, 1986).

The evolutionary nature of organizational learning would require a longitudinal approach, especially for tracking the factors of sustainability of competitive advantage. However, the lack of developed measures of sustainability of competitive advantage and the cross-sectional nature of the data prevented a more thorough analysis of the sustainability of competitive advantage based on organizational learning. Still, some initial exploratory investigation reveals that the most suitable theoretical framework for assessing sustainability of organizational learning is probably the ambiguity argument of the resource-based theory (Reed & DeFillippi, 1990), thus implying that measures of sustainability should be developed within this theory. These findings of sustainability of competitive advantage based on organizational learning are, however, still suggestive and preliminary and would require more in-depth research efforts.

This study used a one-industry research design. Despite its usefulness (Coll & Schendel, 1985), it is still considered as insufficient for generalization of the results. In addition, such a design unabled the test of significance of the relationship between macroenvironment and industry-

specific environmental characteristics (munificence, complexity, and dynamism) with the organizational learning process.

The credit union industry that was used as an industry of research interest might be considered as atypical. Although the results in this study reveal important extensions to the strategic management "boundaries," they still have to be interpreted with caution, partially due to the nature of the industry.

Conclusions

This study - although still preliminary in every aspect - shed some light on our level of understanding and evaluating the strategic dimensions of organizational learning.

The findings on the organizational learning determinants imply that it is a proactive rather than reactive attitude of management that increases organizational learning, thus supporting the difference between learning and environmental adjustment (Fiol & Lyles, 1985). The organizations in the credit union industry use organizational learning as a part of their environmental adjustment as well as their means to improve their competitive position and gain competitive advantage.

Extremely high perceived environmental turbulence might inhibit organizational learning (Argyris & Schon, 1978) by

precluding organizations from fully using their information capacities, thus causing information overload (Huber, 1991; Meier, 1963).

The findings on the relationship between strategic intent and organizational learning and between organizational openness and organizational learning, suggest that organizational learning should be analyzed from the perspective of the resource-based theory (Barney, 1989). First, the information acquisition was best analyzed by using the concept of learning specificity (Reed & DeFillippi, 1990). The specificity of organizational learning is idiosyncratic to the credit union industry rather than to a particular firm. This conclusion differs from Williamson's notion on asset specificity where he argues that assets are idiosyncratic to a particular firm (Williamson, 1985). Second, the "mechanism" of organizational learning of credit unions is primarily based on collecting information by benchmarking the competitors in a financial industry other than credit union.

Organizational learning might be more complex and multifaceted construct than is often suggested by organizational learning literature (i.e. March & Olsen, 1975). It is also a means of gaining competitive position regardless of the firm-specific environment (i.e. location). The organizational learning developed in this study showed statistical significance to be used as a "core" for further research of organizational learning.

Previous research on organizational performance indicated that organizational and economic variables explained only 50.3 percent of the variance of the organizational performance (Hansen & Wernerfelt, 1989), thus leaving almost half of the variance unexplained. This unexplained variance is usually assigned to a "technological change" in economic terms. As indicated in this study, organizational learning variables might provide some additional explanation for organizational performance and thus, organizational learning can be considered as an important explanatory variable of organizational performance.

BIBLIOGRAPHY

- Aaker, D. A. (1989). Managing assets and skills: The key to a sustainable competitive advantage. California Management Review, 31(2), 91-106.
- Abell, D. F., & Hammond, J. S. (1979). Strategic market planning: Problems and analytical approaches. Englewood Cliffs, NJ: Prentice-Hall.
- Abelson, R. P. (1981). Psychological status of the script concept. American Psychologist, 36, 715-729.
- Abernathy, W. J., & Wayne, K. (1974). Limits of the learning curve. Harvard Business Review, 52(5), 109-119.
- Alberts, W. W. (1989). The experience curve doctrine reconsidered. Journal of Marketing, 53(3), 36-49.
- Alchian, A. (1963). Reliability of progress curves in air-frame production. Econometrica, 31, 679-693.
- Aldrich, H. E. (1979). Organizations and environments. Englewood Cliffs, NJ: Prentice-Hall.
- Allison, P. D. (1978). Testing for interaction in multiple regression. American Journal of Sociology, 83, 144-153.
- Amit, R., & Schoemaker, P. J. H. (1993). Strategic assets and organizational rent. Strategic Management Journal, 14, 33-46.
- Ansoff, I. (1965). Corporate strategy. New York: McGraw-Hill.
- Ansoff, I. (1976). Managing strategic surprise by response to weak signals. California Management Review, 18(2), 21-33.
- Argote, L., Beckman, S., & Epple, D. (1987). The persistence and transfer of learning in industrial settings. Paper presented at the meetings of the Institute of Management Sciences (TIMS) and Operations Research Society of America (ORSA), St. Louis, IL.
- Argote, L., Beckman, S. L., & Epple, D. (1990). The persistence of transfer of learning in industrial

- settings. Management Science, 36, 140-154.
- Argyris, C. (1974). Behind the front page. San Francisco: Jossey Bass.
- Argyris, C. (1976). Single-loop and double-loop models in research in decision making. Administrative Science Quarterly, 21, 363-375.
- Argyris, C. (1976). Theories of action that inhibit individual learning. American Psychologist, 39, 638-654.
- Argyris, C. (1977). Double loop learning in organizations. Harvard Business Review, 55(5), 115-125.
- Argyris, C. (1982). Reasoning, learning, and action: Individual and organizational. San Francisco: Jossey-Bass.
- Argyris, C., & Schon, D. A. (1974). Theory in practice: Increasing professional effectiveness. San Francisco: Jossey-Bass.
- Argyris, C., & Schon, D. A. (1978). Organizational learning: A theory of action perspective. Reading: Addison Wesley.
- Arnold, H. J. (1982). Moderator variables: A classification of conceptual, analytic, and psychometric issues. Organizational Behavior and Human Performances, 29, 143-174.
- Arrow, K. (1962). Economic implications of learning by doing. Review of Economic Studies, 29, 155-173.
- Ashby, W. R. (1956). Introduction to cybernetics. New York: Wiley.
- Asher, H. (1956). Cost-quantity relationship in the airframe industry. Santa Monica, CA: Rand Corporation.
- Astley, W. G., & Van de Ven, A. (1983). Central perspectives and debates in organization theory. Administrative Science Quarterly, 28, 245-273.
- Badaracco, J. L., Jr. (1991). The knowledge link: How firms compete through strategic alliances. Boston: Harvard Business School Press.
- Bain, J. S. (1956). Barriers to new competition. Cambridge, MA: Harvard University Press.
- Bales, R. F. (1965). Adaptive and integrative changes as a source of strain in social system. In P. Hare, E. Borgata,

- & R. Bales (Eds.), Small groups (pp.127-131). New York: Alfred A. Koft.
- Balm, G. J. (1992). Benchmarking-nicety of necessity. Tapping the Network Journal.
- Bandura, A. (1977). Social learning theory. Engelwood Cliffs: Prentice Hall.
- Barley, S. R. (1988). The social construction of a machine: Ritual, superstition, magical thinking and other pragmatic responses to running a CT scanner. In M. Lock, & D. Gordon (Eds.), Knowledge and practice in medicine. Hingham, MA: Reidel.
- Barney, J. B. (1986). Strategic factor markets, expectations, luck, and business strategy. Management Science, 42, 1231-1241.
- Barney, J. B. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17, 99-120.
- Bateson, G. (1972). Steps to an ecology of mind. New York: Ballantine.
- Bazerman, M. H. (1984). The relevance of Kahneman and Tversky's concept of framing to organizational behavior. Journal of Management, 10, 333-343.
- Best, M. H. (1990). The new competition. Institutions of industrial restructuring. Cambridge: Polity Press.
- Blalock, H. M., Jr. (1965). Theory building and the statistical concept of interaction. American Sociological Review, 30, 374-380.
- Boeker, W. (1988). Organizational origins: Entrepreneurial and environmental imprinting in founding. In G. Carroll (Ed.), Ecological models of organization. New York: Ballinger.
- Boeker, W. (1989). Strategic change: the effects of founding and history. Academy of Management Journal, 32, 489-515.
- Boston Consulting Group (1972). Perspectives on experience. Boston: Boston Consulting Group.
- Bourgeois, E. H. (1984). Strategic management and determinism. Academy of Management Review, 9, 586-596.
- Burns, T., & Stalker, G. (1961). The management of innovation. London: Tavistock.

- Burrell, G., & Morgan, G. (1979). Sociological paradigms and organizational analysis. London: Heinemann Educational Books.
- Camp, R. C. (1989). Benchmarking: The search for industry best practices that lead to superior performance. Milwaukee: Quality Press.
- Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin, 56, 81-195.
- Cangelosi, V. E., & Dill, W. R. (1965). Organizational learning: observations toward a theory. Administrative Science Quarterly, 10, 175-203.
- Carmines, E. G., & Zeller, R. A. (1979). Reliability and validity assessment. Newbury park, CA: Sage.
- Chandler, A. (1962). Strategy and structure. Cambridge, MA: MIT Press.
- Cherry, C. (1966). On human communication. Cambridge, MA: MIT Press.
- Child, J. (1972). Organization structure, environment and performance: The role of strategic choice. Sociology, 6, 1-22.
- Churchill, G. A., Jr. (1979). A paradigm for developing better measures of marketing constructs. Journal of Marketing Research, 16, 64-73.
- Churchill, G. A., Jr. (1991). Basic marketing research (2nd ed.). The Dryden Press, PA: Philadelphia.
- Clair, R. (1984). Deposit insurance, moral hazard and credit unions. Economic Review, Federal Reserve Bank of Dallas, July, 1-12.
- Cohen, J. (1978). Partial products are interactions; Partial powers are curve components. Psychological Bulletin, 70, 259-267.
- Cohen, J., & Cohen, P. (1975). Applied multiple regression/correlation analysis for the behavioral sciences. Hillsdale, NJ: Erlbaum.
- Conner, K. R. (1991). A historical comparison of resource-based theory and five schools of thought within industrial organization economics: Do we have a new theory of the firm? Journal of Management, 17, 851-884.

- Cool, K., & Schendel, D. (1988). Performance differences among strategic group members. Strategic Management Journal, 9, 207-223.
- Cooper, A. C., & Schendel, D. E. (1976). Strategic responses to technological threats. Business Horizons, 19(1), 61-63.
- Covin, J. G., & Slevin, D. P. (1989). Strategic management of small firms in hostile and benign environments. Strategic Management Journal, 10, 75-87.
- Cox, W. N., & Whigham, P. V. (1984). What distinguishes larger and more efficient credit unions? Economic Review, October, 34-41.
- Coyne, K. P. (1986). Sustainable competitive advantage- What it is and what it isn't. Business Horizons, 29(1), 54-61.
- Credit Unions, Reforms for ensuring future soundness. United States General Accounting Office, Report to the Congress, July, 1984.
- Crossan, M. M. (1991). Organization learning: A sociocognitive model of strategic management. Unpublished doctoral dissertation, University of Western Ontario.
- Cyert, R. M., & March, J. G. (1963). A behavioral theory of the firm. Englewood Cliffs, NJ: Prentice Hall.
- Daft, R. L. (1983). Organization theory and design. New York: West.
- Daft, R. L., & Huber, G. P. (1987). How organizations learn: A Communication framework. Research in the Sociology of Organizations, 5, 1-36.
- Daft, R. L., & Weick, K. E. (1984). Toward a model of organizations as interpretation systems. American Management Review, 9, 284-295.
- Daft, R. L., & Lengel, R. H. (1986). Organizational information requiem media richness and structural design. Management Science, 32, 554-571.
- Daft, R. L., & Macintosh, N. B. (1981). A tentative exploration into the amount and equivocality of information processing in organizational work units. Administrative Science Quarterly, 26, 207-224.
- Daft, R. L., & Wiginton, J. C. (1979). Language and organization. Academy of Management Review, 4, 179-191.

- Day, G. (1977). Diagnosing the product portfolio. Journal of Marketing, 41(3), 230-245.
- Day, R. H., & Wensley, R. (1988). Assessing advantage: A framework for diagnosing competitive superiority. Journal of Marketing, 53(2), 1-20.
- De Geus, A. P. (1988). Planning as learning. Harvard Business Review, 88(2), 70-74.
- Deal, T. E., & Kennedy, A. A. (1982). Corporate culture. Reading, MA: Addison-Wesley.
- Dery, D. (1982). Erring and learning: An organizational analysis. Accounting, Organizations & Society, 7, 217-223.
- Dess, G. G., & Beard, D. W. (1984). Dimensions of organizational task environments. Administrative Science Quarterly, 29, 571-73.
- Dewar, R., & Werbel, J. (1979). Universalistic and contingency predictions of employee satisfaction and conflict. Administrative Science Quarterly, 24, 426-448.
- Dierickx, I., & Coll, K. (1989). Asset stock accumulation and sustainability of competitive advantage. Management Science, 35, 1504-1511.
- Dill, W. R. (1958). Environment as an influence on managerial autonomy. Administrative Science Quarterly, 2, 409-443.
- Dillman, D. A. (1978). Mail and telephone surveys. New York: John Wiley & Sons.
- DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. American Sociological Review, 48, 147-160.
- Doyle, P. (1977). Application of probit, logit and tobit in marketing. Journal of Business Research, 5, 235-248.
- Drazin, R., & Van de Ven, A. H. (1985). Alternative forms of fit in contingency theory. Administrative Science Quarterly, 30, 514-539.
- Duncan, R. B., & Weiss, A. (1979). Organizational learning: Implications for organizational design. In B. Staw (Ed.), Research in organizational behavior (pp.75-123). Greenwich, CT: JAI Press.

- Duncan, R. B. (1972). Characteristics of organizational environment and perceived environmental uncertainty. Administrative Science Quarterly, 17, 313-327.
- Dutton, J., & Duncan, R. (1982). Sense-making and organizational adaptation. Working paper, Northwestern University, J.L. Kellogg Graduate School of Management.
- Dutton, J. M., & Duncan, R. (1983). The creation of momentum for change through process of organizational sensemaking. Unpublished manuscript, Graduate School of Business Administration, New York University.
- Dutton, J. M., & Jackson, S. (1987). Categorizing strategic issues: Links to organizational action. Academy of Management Review, 12, 76-90.
- Dutton, J. M., & Starbuck, W. H. (1978). Diffusion of an intellectual technology. In Krippendorff, K. (Ed.), Communication and control in society, pp.489-511. New York: Gordon and Breach.
- Dutton, J. M., & Thomas, A. (1984). Treating progress functions as managerial opportunities. Academy of Management Review, 9, 235-247.
- Els, R., & Nehemiks, P. (1984). Corporate intelligence and espionage. New York: Macmillan.
- Emory, C. W., & Cooper, D. R. (1991). Business research methods (4th ed.). Homewood, IL: Irwin.
- Farace, R. V., & McDonald, D. (1974). New directions in the study of organizational communication. Personnel Psychology, 27, 1-19.
- Farace, R. B., Monge, P. R., & Russell, H. M. (1977). Communicating and organizing. Reading, MA: Addison-Wesley.
- Feldman, M. S., & March, J. G. (1981). Information in organizations as signal and symbol. Administrative Science Quarterly, 26, 171-186.
- Fiol, C. M., & Lyles, M. A. (1985). Organizational learning. Academy of Management Review, 10, 803-813.
- Flannery, M. (1974). An economic evaluation of credit unions in the United States. Research Report No.54. Federal Reserve Bank of Boston.

- Fuld, L. M. (1985). Competitor intelligence. How to get it; how to use it. New York: John Wiley and Sons.
- Fuld, L. M. (1988). Monitoring the competition: Find out what's really going on over there. Somerset: John Wiley & Sons.
- Galer, G., & van der Heijden, K. (1992). The learning organization: How planners create organizational learning. Marketing Intelligence & Planning, 10(6), 5-12.
- Garvin, D. A. (1993). Building a learning organization. Harvard Business Review, 71, 78-91.
- Ghemawat, P. (1985). Building strategy on the experience curve. Harvard Business Review, 63, 143-149.
- Ghemawat, P. (1986). Sustainable advantage. Harvard Business Review, 64, 53-58.
- Gilad, B., & Gilad, T. (1988). The business intelligence system. New York: American Management Association.
- Gioia, D. A., & Manz, C.C. (1985). Linking cognition and behavior: A script processing interpretation of vicarious learning. Academy of Management Review, 10, 527-539.
- Gioia, D. A., & Poole, P. P. (1984). Scripts in organizational behavior. Academy of Management Review, 9, 449-459.
- Glazer, R. (1990). Marketing in an information-intensive environment: Strategic implications of knowledge as an asset. Journal of Marketing, 55(October), 1-19.
- Graesser, A. C., Woll, S. B., Kowalski, D. J., & Smith, D. A. (1980). Memory for typical and atypical actions in scripted activities. Journal of Experimental Psychology, 6, 503-515.
- Grandori, A. (1987). Perspectives on organization theory. Cambridge: Harper and Row.
- Grant, R. M. (1991). The resource-based theory of competitive advantage: Implications for strategy formulation. California Management Review, 33(3), 114-135.
- Greene, R. M. (1966). Business intelligence and espionage. Homewood, IL: Dow-Jones Irwin.
- Gupta, A. K., & Govindarajan, V. (1984). Business unit strategy, managerial characteristics, and business unit effectiveness at strategy implementation. Academy of Management Journal, 27, 25-41.

- Hair, J. F., Jr., Anderson, R. E., Tatham, R. L., & Black, W. C. (1992). Multivariate data analysis with readings. New York: Macmillan.
- Hall, G., & Howell, S. (1985). The experience curve from the economist's perspective. Strategic Management Journal, 6, 197-212.
- Hamel, G. (1991). Competition for competence and interpartner learning within international alliances. Strategic Management Journal, 12, 83-103.
- Hamel, G., & Prahalad, C. K. (1989). Strategic intent. Harvard Business Review, 67(3), 63-76.
- Hamilton, D. L. (1979). A cognitive-attributional analysis of stereotyping. In Berkowitz, L. (Ed.), Advances in experimental social psychology (Vol.12, pp.53-84). New York: Academic Press.
- Hannan, M. T., & Freeman, J. (1977). The population ecology of organizations. American Journal of Sociology, 82, 929-964.
- Hansen, G. S., & Wernerfelt, B. (1989). Determinants of firm performance: The relative importance of economic and organizational factors. Strategic Management Journal, 10, 399-411.
- Heaton, G. G., & Dunham, C. R. (1985). The growing competitiveness of credit unions. New England Economic Review, May/June, 19-34.
- Hedberg, B. L. T. (1981). How organizations learn and unlearn. In Nystrom, P. C., & Starbuck, W. H., Handbook of Organizational Design (Vol.I, pp.3-27). New York: Oxford University Press.
- Hedberg, B. L. T., Nystrom, P. C., & Starbuck, W. H. (1976). Camping on seesaws: Prescriptions for a self-designing organization. Administrative Science Quarterly, 21, 41-65.
- Heeler, R. M., & Ray, M. L. (1972). Measure validation in marketing. Journal of Marketing Research, 9, 361-370.
- Herriott, S. R., Levinthal, D., & March, J. G. (1985). Learning from experience in organizations. American Economic Review, 75, 298-302.
- Hildebrand, T. (1989). Doing business in United States. Unpublished doctoral dissertation, University of Western Ontario.

- Hirshleifer, J. (1980). Price theory and applications (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Hofer, C. W., & Schendel, D. (1978). Strategy formulation: Analytical concepts. St. Paul, MN: West.
- Hrebiniak, L. G., & Joyce, W. F. (1985). Organizational adaptation: Strategic choice and environmental determinism. Administrative Science Quarterly, 30, 336-349.
- Huber, G. P. (1982). Organizational information systems: Determinants of their performance and behavior. Management Science, 28, 135-155.
- Huber, G. P. (1991). Organizational learning: The contributing processes and the literatures. Organization Science, 2, 88-115.
- Huber, G. P., Ullman, J., & Leifer, R. (1979). Optimum organization design: An analytic-adoptive approach. Academy of Management Review, 4, 567-578.
- Huff, A. S. (1990). Mapping strategic thought. New York: John Wiley & Sons.
- Hughes, M. A., Price, R. L., & Mars, D. W. (1986). Linking theory construction and theory testing: Models with multiple indicators of latent variables. Academy of Management Review, 11, 128-44.
- Imai, K., Nonaka, I., & Takeuchi, H. (1985). Managing new product deveopment process: How Japanese companies learn and unlearn. In K. Clark, R. Hayes, & C. Lorentz, C. (Eds.), The uneasy alliance (pp.337-375). Boston: Harvard Graduate School of Business.
- Itami, H., & Roehl, T. W. (1987). Mobilizing invisible assets. Cambridge: Harvard University Press.
- Jelinek, M. (1979). Institutional innovations: A study of organizations learning systems. New York: Praeger.
- Jemison, D. B., & Sitkin, S. B. (1986). Corporate acquisitions: A process perspective. Academy of Management Review, 11, 145-163.
- Jones, E., & Johnson, A. (1977). Delay of consequences and the riskiness of decisions. Journal of Personality, 41, 613-637.
- Jurkovich, R. (1974). A core typology of organizational

- environments. Administrative Science Quarterly, 19, 380-394.
- Kahneman, D. (1973). Attention and effort. Englewood Cliffs, NJ: Prentice-Hall.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. Econometrica, 47, 263-291.
- Kelley, H. H. (1973). The processes of causal attribution. American Psychologist, 28, 107-128.
- Kerin, R. A., Mahajan, V., & Varadarajan, P. R. (1990). Contemporary perspectives on strategic market planning. Boston: Allyn and Bacon.
- Kerlinger, F. N. (1986). Foundations of behavioral research (3rd ed.). Holt, Rinehart and Winston, IL: Chicago.
- Khandwalla, P. N. (1977). The design of organizations. Harcourt Brace Jovanovich, NY: New York.
- Kim, J., & Muellar, C. W. (1978). Factor analysis: Statistical methods and practical issues. Beverly Hills, CA: Sage.
- Kimberly, J. R. (1979). Issues in creation of organizations: Initiation, innovation, and institutionalization. Academy of Management Journal, 22, 437-457.
- Kimberly, J. R. (1981). Managerial innovation. In N. C. Nystrom, & W. H. Starbuck, Handbook of organizational design (pp.84-104). Oxford: Oxford University Press.
- King, D. W. (1980). Key papers in the economics of information. New Plains, NY: Knowledge Industry Publications.
- Klein, J. I. (1989). Parenthetic learning in organizations: Toward the unlearning of the unlearning model. Journal of Management Studies, 26, 291-308.
- Kogut, B. (1988). Joint ventures: Theoretical and empirical evidence. Strategic Management Journal, 9, 319-332.
- Kohers, T. (1986). Parent organizations activities as a cause for differential credit union operating characteristics. Southwest Journal of Business and Economics, 4, 11-21.
- Kohers, T., & Mullins, D. (1986). The effects of parent company business on occupational credit union behavior. Applied Economics, 18, 1311-1321.

- Kohers, T., & Mullins, D. (1987). Credit union size as a cause for different operating characteristics. Mid-South Business Journal, 7 (January), 14-18, 28.
- Kohers, T. & Mullins, D. (1988). An update on economies of scale in credit unions. Applied Economics, 20, 1653-1659.
- Koot, R. (1978). On economies of scale in credit unions. Journal of Finance, 33, 1087-1094.
- Kraut, A. J. (1976). Behavior modeling symposium: Developing managerial skills via modeling techniques. Personnel Psychology, 29, 325-328.
- Krone, K. J., Jablin, F. M. & Putnam, L. L. (1987). Communication theory and organizational communication: Multiple perspectives, In F. M. Jablin, L. L. Putnam, K. H. Roberts, & L. W. Porter (Eds.), Handbook of organizational communication. Newbury Park, CA: Sage Publications.
- Lado, A. A. (1992). Risk and strategic intent in cross border alliance choice: A theoretical and empirical investigation. Unpublished doctoral dissertation. Memphis State University.
- Lado, A. A., Boyd, N. G., & Wright, P. (1991). A competency-based model of sustainable competitive advantage: Toward a conceptual integration. Journal of Management, 18, 77-91.
- Langer, E. J. (1978). Rethinking the role of thought in social interaction. In J. H. Harvey, W. J. Ickes, & R. F. Kidd (Eds.), New directions in attribution research (Vol.2, pp.35-58). Hillsdale, NJ: Erlbaum.
- Laudon, K. C., & Laudon, J. P. (1988). Management information systems. A contemporary perspective. New York: Macmillan.
- Lawrence, P. R., & Dyer, D. (1983). Renewing American industry. New York: The Free Press.
- Lawrence, P. R., & Lorsch, J. (1967). Organization and environment. Boston, MA: Harvard University Press.
- Lengel, R. H. (1983). Managerial information processing and communication-media source selection behavior. Unpublished doctoral dissertation, Texas A&M University.
- Leonard-Barton, D. (1992). The factory as a learning laboratory. Sloan Management Review, 34(1), 23-38.

- Levitt, B., & March, J. G. (1988). Organizational learning. Annual Review of Sociology, 14, 319-340.
- Lieberman, M. B. (1989). The learning curve, technological barriers to entry, and competitive survival in the chemical processing industries. Strategic Management Journal, 10, 431-447.
- Liebfried, K. H. J., & McNair, C. J. (1992). Benchmarking: A tool for continuous improvement. New York: Harper Business.
- Lindblom, C. E. (1959). The science of muddling through. Public Administration Review, 19, 78-88.
- Lippman, S. A., & Rumelt, R. P. (1982). Uncertain imitability: An analysis of interfirm differences in efficiency under competition. The Bell Journal of Economics, 13, 418-438.
- Loewenstein, G. F. (1988). Frames of mind in intertemporal choice. Management Science, 34, 200-214.
- Lord, R. G., & Kernan, M. C. (1987). Scripts as determinants of purposeful behavior in organizations. Academy of Management Review, 12, 265-277.
- Lord, R. G., & Smith, J. E. (1983). Theoretical information processing, and situational factors affecting attribution models of organizational behavior. Academy of Management Review, 8, 50-60.
- Lyles, M. A. (1988). Learning among joint-ventures sophisticated firms. Management International Review, 28, 85-98.
- Lyles, M. A. (1990). A research agenda for strategic management in the 1990s, Journal of Management Studies, 27, 363-375.
- Manz, C. C., & Sims, H. P., Jr. (1981). Vicarious learning: The influence of modeling on organizational behavior. Academy of Management Review, 6, 105-113.
- March, J. G. (1981). Footnotes to organizational change. Administrative Science Quarterly, 26, 563-577.
- March, J. G. (1988). Decisions and organizations. New York: Basil Blackwell.
- March, J. G. (1991). Exploration and exploitation in organizational learning. Organizational Science, 2, 71-87.

- March, J. G., & Olsen, J. P. (1975). The uncertainty of the past: Organizational learning under ambiguity. European Journal of Political Research, 3, 147-171.
- Martello, W. E. (1993). Scripts as a practical tool for strategic action. Paper presented at the 13th Annual International Conference, Strategic Management Society. IL: Chicago.
- Mason, E. S. (1939). Price and production policies of large-scale enterprises. American Economic Review, 29, 61-74.
- Mason, J., & Lollar, J. (1986). Developing market driven strategies for credit union growth and survival. Journal of Professional Services Marketing, 2, 91-108.
- McKenna, S. D. (1992). A culture instrument: Driving organizational learning. Leadership & Organizational Development Journal, 13(6), 24-29.
- McShane, S. L. (1986). The multidimensionality of union participation. Journal of Occupational Psychology, 59, 177-187.
- Meier, R. L. (1963). Communications overload: Proposals from the study of a university library. Administrative Science Quarterly, 4, 521-544.
- Meyer, A. D. (1982). Adapting to environmental jolts. Administrative Science Quarterly, 27, 515-537.
- Meyer, A. D. (1991). What is strategy's distinctive competence? Journal of Management, 17, 821-833.
- Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. American Journal of Sociology, 83, 440-463.
- Meyer, N. D., & Boone, M. E. (1987). The information edge. New York: McGraw Hill.
- Miles, R. H. (1982). Coffin nails and corporate strategies. Englewood Cliffs, NJ: Prentice-Hall.
- Miles, R. E., Snow, C. C., & Pfeffer, J. (1974). Organization-environment: Concepts and issues. Industrial Relations, 13, 244-264.
- Miller, D., & Friesen, P. H. (1980). Momentum and revolution in organization adaptation. Academy of Management Journal, 23, 591-614.

- Miller, D., & Friesen, P. H. (1982). Innovation in conservative and entrepreneurial firms.: Two models of strategic momentum. Strategic Management Journal, 3, 1-25.
- Miller, J. G., De Meyer, A., & Nakane, J. (1992). Benchmarking global manufacturing: Understanding international suppliers, customers, and competitors. Homewood: Business One Irwin.
- Mills, D. Q., & Friesen B. (1992). The learning organization. European Management Journal, 10(2), 146-156.
- Miner, J. B. (1982). Theories of organizational structure and process. Hinsdale, IL: Dryden.
- Minsky, M. (1975). A framework for representing knowledge. In P. H. Winston (Ed.), The psychology of computer vision (pp.211-277). New York: McGraw-Hill.
- Mintzberg, H. (1975). The manager's job: Folklore and fact. Harvard Business Review, 53, 49-61.
- Moore, J. S., & Reichert, A. K. (1989). A multivariate study of firm performance and the use of modern analytical tools and financial techniques. Interfaces, 19, 79-87.
- Morgan, G. (1986). Images of organization. Beverly Hills: Sage.
- Morgan, G., & Ramirez, R. (1983). Action learning: A holographic metaphor for guiding social change. Human Relations, 37, 1-28.
- Morrison, D. G. (1969). On the interpretation of discriminant analysis. Journal of Marketing Research, 6, 156-163.
- Mowen, J. C., & Mowen, M. M. (1991). Time and outcome valuation: Implications for marketing decision making. Journal of Marketing, 55, 54-62.
- Muth, J. F. (1986). Search theory and the manufacturing progress function. Management Science, 32, 948-962.
- Naman, J. L., & Slevin, D. P. (1993) Entrepreneurship and the concept of fit: A model and empirical test. Strategic Management Journal, 14, 137-153.
- Nelson, R. R., & Winter, S. G. (1982). An evolutionary theory of economic change. Cambridge, MA: Harvard University Press.

- Neustadt, R. E., & May, E. R. (1986). Thinking in time: The uses of history for decision makers. New York: Free Press.
- Nonaka, I., & Johansson, J. K. (1985). Organizational learning in Japanese companies. In R. Lamb, & P. Shrivastava, Advances in Strategic Management (vol.3, pp.277-298). Greenwich, CT: JAI Press.
- Nunnally, J. (1967). Psychometric methods. New York, NY: McGraw-Hill.
- Nunnally, J. (1978). Psychometric theory. New York, NY: McGraw-Hill.
- Nystrom, P. C., & Starbuck, W. H. (1984). To avoid organizational crises, unlearn. Organizational Dynamics, 12(4), 53-65.
- Parker, B. B. (1985). Predictors of organizational response to decline: A test of the contingency and strategic choice perspectives. Unpublished doctoral dissertation, University of Colorado at Boulder.
- Pattison, D. D., & Teplitz, C. J. (1989). Are learning curves still relevant? Management Accounting-USA, 70(8), 37-40.
- Pearce, D. (1984). Recent developments in the credit union industry. Economic Review, Federal Reserve Bank of Kansas City, June, 3-19.
- Peter, J. P. (1979). Reliability: A review of psychometric basics and recent marketing practices. Journal of Marketing Research, 16, 6-17.
- Peteraf, M. A. (1993). The cornerstones of competitive advantage: A resource-based view. Strategic Management Journal, 14, 179-192.
- Platt, J. (1973). Social traps. Science, 28, 641-651.
- Polanyi, M. (1967). The tacit dimension. New York: Doubleday.
- Porter, L. W., & Roberts, K. H. (1976). Communications in organizations. In M. D. Dunnette, M. D.(Ed.), Handbook of industrial and organizational psychology. Chicago: Rand McNally.
- Porter, M. E. (1980). Competitive strategy. New York: Free Press.
- Porter, M. E. (1985). Competitive advantage. New York: Free Press.

- Porter, M. E., & Millar, V. E. (1985). How information gives you competitive advantage. Harvard Business Review, 63, 149-160.
- Prahalad, C. K., & Hamel, G. (1990). The core competence of the corporation. Harvard Business Review, 68, 79-91.
- Przybylowicz, E. P., & Faulkner, T. W. (1993). Kodak applies strategic intent to the management of technology, Research-Technology Management, 36(1), 31-38.
- Pucik, V. (1988). Strategic alliances, organizational learning, and competitive advantage: The HRM agenda. Human Resource Management, 27(1), 77-93.
- Puto, C. P. (1987). The framing of buying decisions. Journal of Consumer Research, 14, 301-315.
- Qualls, W. J., & Puto, C. P. (1989). The framing of buying decisions. Journal of Consumer Research, 14, 301-315.
- Quinn, J. B. (1980). Strategies for change: Logical incrementalism. Homewood: Irwin.
- Ramanujam, V. (1993). Toward a new paradigm of competitiveness for the 1990's. Paper presented at 13th Annual International Conference of Strategic Management Society. Chicago.
- Randolph, W. A. (1978). Organizational technology and the media purpose dimensions of organization communications. Journal of Business Research, 6, 237-259.
- Ready, D. A. (1992). Building transactional partnership in executive learning through applied research. Journal of Management Development, 11(6), 46-52.
- Reed, R., & DeFillippi, R. (1990). Causal ambiguity, barriers to imitation, and sustainable competitive advantage. Academy of Management Review, 15, 88-102.
- Reichert, A. K., & Rubens, J. (1994). Risk management techniques employed within the U.S. credit union industry. Journal of Business Finance & Accounting, 21, 15-35.
- Reimann, B. C. (1972). Management concern, context, and organization structure. Unpublished doctoral dissertation. Kent State University.
- Reimann, B. C. (1982). Organizational competence as a predictor of long run survival and growth. Academy of Management Journal, 25, 323-334.

- Reimann, B. C. (1987). Managing for value. Oxford: Basil Blackwell.
- Rockart, J. (1979). Chief executives define their own data needs. Harvard Business Review, 57(2), 81-93.
- Rogers, E. M., & Schoemaker, F. F. (1971). Communication of innovations. New York: Free Press.
- Rumelt, R. P. (1984). Toward a strategic theory of the firm. In R. Lamb (Ed.), Competitive strategic management (pp.556-570). Englewood Cliffs: Prentice Hall.
- Rumelt, R. P. (1987). Theory, strategy, and entrepreneurship. In D. J. Teece (Ed.), The competitive challenge (pp.139-158). Cambridge, MA: Ballinger.
- Sabatier, P. (1978). The acquisition and utilization of technical information by administrative agencies. Administrative Science Quarterly, 23, 396-417.
- Sammon, W. L, Kurlan, M. A., & Spitalnic, R. (1984). Business competitor intelligence: Methods for collecting, organizing, and using information. New York: John Wiley & Sons.
- Schein, E. H. (1984). Coming to new awareness of organizational culture. Sloan Management Review, 12(1), 3-16.
- Schon, D. A. (1975). Deutero-learning in organizations - Learning for increased effectiveness. Organizational Dynamics, 4(1), 2-16.
- Schneider, D. J. (1973). Implicit personality theory: A review. Psychological Bulletin, 79, 294-309.
- Schumpeter, J. A. (1942). Capitalism, socialism and democracy. New York: Harper and Row.
- Schwab, D. P. (1980). Construct validity in organizational behavior. In B. M. Staw & L. L. Cummings (Eds.), Research in organizational behavior (Vol.11, pp.3-43). Greenwich, CT: JAI Press.
- Selto, F. H., & Clouse, M. (1985). An investigation of managers. Adaptations to SFASNo.2: Accounting for research and developing costs. Journal of Accounting Research, 23, 700-717.
- Selznick, P. (1957). Leadership in administration: A

- sociological interpretation. New York: Harper & Row.
- Senge, P. M. (1990). The fifth discipline. The art and practice of the learning organization. New York: Doubleday.
- Senge, P. M. (1991). Learning organizations. Executive Excellence, 8(9), 7-8.
- Senge, P. M. (1992). Mental models. Planning Review, 20(2), 4-10.
- Senge, P. M., & Sterman, J. D. (1992). Systems thinking and organizational learning: Acting locally and thinking globally in the organization of the future. European Journal of Operational Research, 59(1), 137-150.
- Shannon, C. E., & Weaver, W. (1973). The mathematical theory of communication. Urbana, Illinois: University of Illinois Press.
- Shrivastava, P. (1983). A typology of organizational learning systems. Journal of Management Studies, 20(1), 1-28.
- Shukla, R. K. (1982). Influence of power bases on organizational decision making: A contingency model. Decision Sciences, 13, 450-470.
- Simon, H. A. (1976). Administrative behavior. New York: Free Press.
- Simon, H. (1991). Bounded rationality and organizational learning. Organization Science, 2(1), 125-134.
- Sims, H. P., & Goia, D. A. (Eds.). (1986). The thinking organizations: Dynamics of organizational social cognition. San Francisco: Jossey-Bass.
- Slevin, D. P., & Covin, J. G. (1990). Juggling entrepreneurial style and organizational structure- How to get your act together. Sloan Management Journal, 18, 43-53.
- Slevin, D. P., & Naman, J. L. (1991). Entrepreneurship audit: Measuring your firm's fit with its environment. Innodyne, PA: Pittsburgh.
- Smith, G. D., & Steadman, L. E. (1981). Present value of corporate history. Harvard Business Review, 59, 164-173.
- Smircich, L. (1983). Concepts of culture in organizational analysis. Administrative Science Quarterly, 28, 339-358.

- Smith, P. E. (1976). Management modeling training to improve morale and customer satisfaction. Personnel Psychology, 29, 351-359.
- Snyder, N. H. & Glueck W. F. (1982). Can environmental volatility be measured objectively? Academy of Management Journal, 25, 185-192.
- Sommer, R. (1969). Personal space. Englewood Cliffs, NJ: Prentice Hall.
- Spekman, R. E. (1979). Influence and information: An exploratory investigation of the boundary role person's basis of power. Academy of Management Journal, 22, 104-117.
- Spence, A. M. (1981). The learning curve and competition. The Bell Journal of Economics, 12, 49-70.
- Spender, J. C. (1993). Competitive advantage from tacit knowledge? Unpacking the concept and its strategic implications. Best Papers Proceedings, Academy of Management 53rd Annual Meeting, Atlanta, GA.
- Starbuck, W. H., Greve, A., & Hedberg, B. (1978). Responding to crisis. Journal of Business Administration, 9, 112-137.
- Stata, R. (1989). Organizational learning - The key to management innovation. Sloan Management Review, 30(3), 63-74.
- Stinchcombe, A. L. (1965). Social structure and organizations, In J. G. March (Ed.), Handbook of organizations. Chicago: Rand McNally.
- Stone, E. F., & Hollenbeck, J. R. (1984). Some issues associated with the use of moderated regression. Organizational Behavior and Human Performance, 34, 195-213.
- Straw, B.M. (1977). The experimenting organization: Problems and prospects. In Psychological foundations of organization behavior. Pacific Palisades, CA: Goodyear.
- Taylor, R. (1972). Economies of scale at large credit unions. Applied Economics, 4, 30-40.
- Taylor, R. S. (1986). Value-added processes in information systems. Norwood, NJ: Ablex Publishing Corporation.
- Teece, D. J., Pisano, G., & Shuen, A. (1990). Firm capabilities, resources, and the concept of strategy: Four paradigms of strategic management (CCC Working Paper,

No.90-8). Berkley: Center for research in management, University of California at Berkley.

- Thayer, L. (1967). Communication and organization theory. In F.E.X. Dance (Ed.), Human communication theory: Original essays. New York: Holt, Rinehart, and Winston.
- Thompson, J. D. (1967). Organizations in action. New York: McGraw-Hill.
- Tomer, J. F. (1987). Organizational capital: The path to higher productivity and well-being. New York: Praeger.
- Trauth, E. M. (1978). A study of some of the terms relevant to the field of information science. Unpublished collection of papers. Interdisciplinary Department of Information Science, University of Pittsburgh.
- Tung, R. L. (1979). Dimensions of organizational environment: An exploratory study of their impact on organization structure. Academy of Management Journal, 22, 672-693.
- Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. Science, 2, 453-458.
- Ulrich, D., & Lake, D. (1991). Organizational capability: Creating competitive advantage. Academy of Management Executive, 5(1), 77-92.
- Valenca Pereira, A. C. (1990). Dialectical perspectives on organizational learning. Unpublished doctoral dissertation, Case Western Reserve University, Cleveland.
- Van de Ven, A., & Ferry, D. (1979). Measurement and assessment of organizations. New York, NY: John Wiley.
- Van Maanen, J., & Schein, E. H. (1979). Toward a theory of organizational socialization. In B. M. Straw (Ed.), Research in organizational behavior (Vol.1, pp.209-264). Greenwich, CT: JAI Press.
- Venkatraman, N. (1989). Strategic orientation of business enterprises: The construct, dimensionality, and measurement. Management Science, 35, 942-962.
- Venkatraman, N. (1989). Strategic orientation of business enterprises: The construct, dimensionality, and measurement. Management Science, 35, 942-962.
- Venkatraman, N., & Grant, J. H. (1986). Construct measurement in strategy research: A critique and proposal. Academy of

Management Review, 11, 71-86.

- Venkatraman, N., & Ramanujam, V. (1987). Measurement of business economic performance: An examination of method convergence. Journal of Management, 13, 109-122.
- Von Bertalanffy, L. (1968). General systems theory: Foundations, development, applications. New York: Braziller.
- Von Krogh, G. & Roos, J. (1993). Imitation of knowledge: A sociology of knowledge perspective. Paper presented at 13th Strategic Management Society Conference, Chicago.
- Walsh, J. P., & Ungson, G. R. (1991). Organizational memory. Academy of Management Review, 16, 57-91.
- Watson, G. H. (1993). How process benchmarking supports corporate strategy. Planning Review, 21(1), 12-15.
- Weick, K. E. (1979). The social psychology of organizing. Reading: Addison-Wesley.
- Weick, K. E. (1991). The nontraditional quality of organizational learning. Organization Science, 2(1), 116-123.
- Weinshall, T. D. (1979). Managerial communication: Concepts, approaches, and techniques. New York: Academic Press.
- Wernerfelt, B. (1984). A resource-based view of the firm. Strategic Management Journal, 5, 171-180.
- White, H. (1980). A heteroscedasticity-consistent covariance matrix estimator and a direct test for heteroscedasticity. Econometrica, 48, 817-838.
- Wiener, N. (1961). Cybernetics. Cambridge, MA: MIT Press.
- Wiener, Y. (1988). Forms of value systems: A focus on organizational effectiveness and cultural change and maintenance. Academy of Management Review, 13, 534-545.
- Wildavsky, A. (1972). The self-evaluating organization. Public Administration Review, 32, 509-520.
- Wilensky, H. (1967). Organizational intelligence. New York: Basic Books.
- Williams, J. R. (1992). How sustainable is your competitive advantage? California Management Review, 34(3), 29-51.

- Williamson, O. E. (1979), Transaction cost economics: The governance of contractual relations. Journal of Law and Economics, 22, 233-261.
- Williamson, O. E. (1985). The economic institutions of capitalism. New York: The Free Press.
- Winter, S. G. (1987). Knowledge and competence as strategic assets. In D. J. Teece (Ed.), The competitive challenge (pp.159-184). Cambridge, MA: Ballinger.
- Wolken, J., & Navratil, F. (1980). The economies of scale at credit unions: Further evidence. Journal of Finance, 35, 1157-1168.
- Wolken, J., & Navratil, F. (1985). The choice of regulatory regime: A logit analysis of credit union chartering. Quarterly Review of Economics and Business, 25, 40-57.
- Wortman, M. S. (1979). Strategic management: Not-for-profit organizations. In D. E. Schendel, & C. W. Hofer (Eds.), Strategic management: A new view of business policy and planning (pp.353-381). Little, Brown and Company, MA: Boston.
- Wright, P., & Weitz B. (1977). Time horizon effects on product evaluation strategies. Journal of Marketing Research, 14, 429-443.
- Wright, T. P. (1936). Factors affecting the cost of airplanes. Journal of Aeronautical Sciences, 3(4), 122-128.
- Yelle, L. E. (1979). The learning curve: Historical review and comprehensive survey. Decision Science, 10, 302-328.
- Zahra, S. A., & Covin, J.G. (1993). Business strategy, technology policy and firm performance. Strategic Management Journal, 14, 451-478.
- Zucker, L. G. (1977). The role of institutionalization in cultural persistence. American Sociological Review, 42, 726-743.

APPENDICES

APPENDIX A

Step 1: Using the formula for infinite population:

$$\text{Formula: } n = (Z^2 b (100 - b)) / D^2,$$

where n = required sample size

Z = normal curve coefficient for desired confidence level

b = estimate population proportion

D = maximum allowable percentage error between true population proportion (b) and sample statistic (b/est)

$$n = (38416 * 50(100-50)) / 25 \\ = 384$$

Step 2: Small population adjustment factor:

$$\text{Formula: } n^* = (n(N-n)) / (N-1)$$

where $n = 384$

$N = 455$

$$n^* = (384(455-384)) / 454 \\ = 60$$

Step 3: Calculation of sample size (nm) for given estimated response rate (r):

$$\text{Formula: } nm = n^* / (r(.01))$$

where $n^* = 60$

$r(\text{assumed}) = 30\%$

$$nm = 60 / .3 \\ = 200$$

APPENDIX B

Steps in questionnaire development (Churchill, 1991):

1. Specify what information will be sought.
2. Determine of what types of the questionnaire and method of administration.
3. Determine content of individual questions.
4. Determine form of response to each question.
5. Determine wording of each question.
6. Determine the sequence of questions.
7. Determine physical characteristics of questionnaire.
8. Reexamine steps 1-7 and revise if necessary.
9. Pretest questionnaire (test for content validity) and revise if necessary.

APPENDIX C

Cover Letter Preparation

Cover letter was prepared based on the instructions given by Churchill (1991). Cover letter should include the following contents (Churchill, 1991, p.354):

1. Personal communication
2. Asking a favor
3. Importance of the research project and its purpose
4. Importance of the recipient
5. Importance of the replies in general
6. Importance of the replies when the reader is not qualified to answer most questions
7. How recipient may benefit from this research
8. Completing the questionnaire will take only a short time
9. The questionnaire can be answered easily
10. A stamped envelope is enclosed
11. How recipient was selected
12. Answers are anonymous and confidential
13. Offer to send a report on result of survey
14. Note of urgency
15. Appreciation of sender
16. Importance of sender
17. Importance of sender's organization
18. Description and purpose of incentive
19. Avoid bias
20. Style
21. Format and appearance
22. Brevity

APPENDIX D
Cover Letter I

OHIO CREDIT
UNION LEAGUE
AND AFFILIATES



November 5, 1993

Dear CEO/Manager,

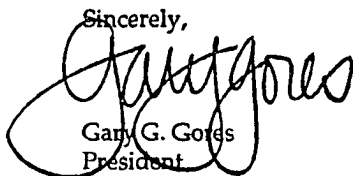
I recently had the opportunity to meet with Mr. Vlado Dimovski. Mr. Dimovski is an Assistant Professor on leave from the University of Ljubljana in Slovenia and is currently a Graduate Assistant at Cleveland State University.

Mr. Dimovski is compiling research for his doctoral thesis on Organizational Learning as it applies to credit unions. I believe this research is vital to the future of credit union development. His preliminary research is exciting, and I'm confident that better management training opportunities can be developed based on his theories and findings.

Would you please take a few minutes of your valuable time to fill out the enclosed questionnaire and return it as soon as possible? I truly believe the results of this research project will produce a much greater understanding of our credit unions' ability to work, function, grow, and become more competitive.

Thank you for your cooperation.

Sincerely,



Gary G. Gores
President

GGG/EE

Enclosures

1201 Dublin Road • Columbus, Ohio 43215 • 1-800-486-2917 • FAX 1-614-486-6044

APPENDIX E
Cover Letter II



James J. Nance College of Business
Administration

Department of Management
and Labor Relations
Euclid Avenue at East 24th Street
Cleveland, Ohio 44115
Telephone: (216) 687-4754

November 4, 1993

Dear credit union CEO (general manager):

I am currently conducting a research on strategic management and organizational learning under the supervision of Dr. Reimann. A major component of this research is a survey of CEOs and general managers in the credit union industry. This research is a part of my doctoral dissertation thesis and I would appreciate your help in conducting my research. Briefly, the purpose of my dissertation is to explore whether credit unions can improve their organizational performance based on organizational learning.

Organizational learning has emerged as one of the most promising concepts in strategic management for the 1990s. As a premier researcher in the field of organizational learning stated in a Harvard Business Review article, "the ability to learn faster than your competitors may be the only sustainable competitive advantage" (De Geus, 1988).

The enclosed questionnaire is designed for ease of completion and should not take more than 15 minutes to complete. If you do not know the answer to a certain question, skip it and proceed to the next one. Your credit union appeared in a random sample among all credit unions in Ohio whose total asset size was greater than \$1 million as of December 1992. Of course, all the answers are confidential and will be used exclusively for research purposes.

Please return the completed questionnaire in the enclosed envelope at your earliest convenience. Dr. Reimann and I are very grateful for your cooperation. After the completion of this research, the copies of a summary report will be available upon request from the authors.

Sincerely yours,

A handwritten signature in cursive script that reads "Vlado Dimovski".

Vlado Dimovski
Doctoral Candidate

Dr. Bernard C. Reimann
Professor of Management

APPENDIX F
Questionnaire on Organizational Learning



ORGANIZATIONAL LEARNING QUESTIONNAIRE

*Please return completed questionnaire in the
accompanying self-addressed envelope to:*

Vlado Dimovski
Cleveland State University
Department of Management and Labor Relations
2121 Euclid Avenue
Cleveland, OH 44115

Please circle one choice for each of the items in sections I-IV (1 - strongly disagree; 2 - disagree; 3 - undecided; 4 - agree; 5 - strongly agree).

I. ENVIRONMENTAL TURBULENCE

Indicate your degree of agreement or disagreement with the following statements that refer TO ACTUAL CONDITIONS IN THE CREDIT UNION INDUSTRY.

	Strongly Disagree				Strongly Agree
1. Our credit union must change its marketing practices frequently to keep up with market competitors	1	2	3	4	5
2. The rate at which new services are getting obsolete is very high	1	2	3	4	5
3. Actions of competitors are unpredictable	1	2	3	4	5
4. Demand and consumer preferences are unpredictable	1	2	3	4	5
5. The service/product technology changes very frequently	1	2	3	4	5

Indicate the character of the external environment WITHIN WHICH YOUR CREDIT UNION FUNCTIONS.

	Strongly Disagree				Strongly Agree
6. Our credit union operates in an extremely risky environment	1	2	3	4	5
7. Our credit union's industry environment has many threats to the survival and well-being of the credit union	1	2	3	4	5
8. Our credit union's environment has many marketing opportunities	1	2	3	4	5
9. Our credit union's initiatives have very little influence on our environment (i.e. political, technological, etc.)	1	2	3	4	5

II. STRATEGIC INTENT

Indicate your degree of agreement or disagreement on THE PURPOSE OF PROCESSING INFORMATION.

The purpose of collecting, interpreting, distributing, and using any type of information in your credit union is:

	Strongly Disagree		Strongly Agree	
1. To offer a wider range of services	1	2	3	4 5
2. To achieve a high overall reputation in financial services industry	1	2	3	4 5
3. To increase the quality of services offered	1	2	3	4 5
4. To undertake innovations in offering services	1	2	3	4 5
5. To understand the market needs for consumer banking services	1	2	3	4 5
6. To increase the members' satisfaction with the services offered	1	2	3	4 5
7. To tailor the services to satisfy specific needs of the target market	1	2	3	4 5
8. To minimize the possible uncertainties of the industry environment	1	2	3	4 5
9. To increase the speed of services	1	2	3	4 5
10. To set competitive prices/charges for services offered	1	2	3	4 5
11. To increase the overall productivity of the credit union	1	2	3	4 5
12. To increase the efficiency of equipment in use (e.g. PCs, terminals, etc.)	1	2	3	4 5
13. To increase the use of employees' skills	1	2	3	4 5

III. OPENNESS

The following statements describe the characteristics of the credit union's openness towards the industry and economic environment. Indicate the degree of agreement or disagreement with the statements referring to YOUR CREDIT UNION'S OPENNESS.

	Strongly Disagree		Strongly Agree	
1. Exchanging information with other credit unions is extremely important	1	2	3	4 5
2. Accepting advice or suggestions (i.e. from members) is an extremely important practice	1	2	3	4 5
3. Putting a lot of effort into becoming recognizable to as many potential customers as possible is an important practice	1	2	3	4 5
4. Our credit union is always willing to get involved in joint tasks or projects with other credit unions if it improves our performance	1	2	3	4 5
5. Involvement in the community is extremely important (contributions, supports, etc.)	1	2	3	4 5
6. Our top managers have many business contacts with top managers of other credit unions	1	2	3	4 5
7. Our top managers have many business contacts with top managers in industries other than credit union	1	2	3	4 5

IV. INFORMATION ACQUISITION

Credit unions obtain information for their business from different sources. Indicate the degree of agreement or disagreement with the statements that BEST REFLECTS YOUR CREDIT UNION'S PRACTICE IN OBTAINING INFORMATION FROM DIFFERENT SOURCES.

	Strongly Disagree				Strongly Agree
1. Our credit union members are an extremely important source of information about the market needs for consumer financial services	1	2	3	4	5
2. Previous decisions are a very useful source of information for current decisions	1	2	3	4	5
3. New business methods and services are always worth trying even if they may prove risky	1	2	3	4	5
4. Reports on the credit union industry prepared by industry experts (i.e. CUNA or NCUA) are an extremely important source of information	1	2	3	4	5
5. Reports from outside the credit union are an extremely important source of information (i.e. newspapers, etc.)	1	2	3	4	5
6. Our credit union is always alert to any special reports and articles about the credit union industry	1	2	3	4	5
7. Other credit unions are an extremely important source for learning new methods and services	1	2	3	4	5
8. Commercial banks and thrifts are extremely important sources for learning new methods and services	1	2	3	4	5
9. Expertise on the credit union industry is an extremely important criterion for hiring a new employee	1	2	3	4	5
10. Joint tasks and mergers contribute a great deal of knowledge about industry and economic environment, new methods and services/products	1	2	3	4	5

Indicate the degree of agreement or disagreement with the following statements that BEST DESCRIBE YOUR CREDIT UNION'S USE OF EXTERNAL INFORMATION COMPARED TO INTERNAL INFORMATION.

	Strongly Disagree				Strongly Agree
1. Top-managers in any important decision seek information or advice from sources outside the credit union (hiring experts, contacting top managers of other credit unions, etc.)	1	2	3	4	5
2. Top-managers in any important decision seek information or advice from the board of directors	1	2	3	4	5
3. The credit union has employees whose job is related to searching for external information	1	2	3	4	5
4. External sources (reports, consultants, newsletters, etc.) are extremely important for the credit union's operations	1	2	3	4	5

V. INFORMATION INTERPRETATION

Indicate the degree of importance of the following statements about vehicles for communication between management and the other employees IN YOUR CREDIT UNION. Please circle one choice for each of the following seven statements (1 - of little importance; 2 - not important; 3 - somewhat important; 4 - important; 5 - extremely important).

	Of Little Importance				Very Important
1. Personal contact	1	2	3	4	5
2. Team meetings	1	2	3	4	5
3. Committees as decision-makers	1	2	3	4	5
4. Telephone contacts	1	2	3	4	5
5. Written memos, letters,...	1	2	3	4	5
6. Special reports	1	2	3	4	5
7. Formal chain of command reporting	1	2	3	4	5

Indicate the degree of agreement or disagreement with the following statements about YOUR ATTITUDE AS A TOP MANAGER ABOUT INFORMING THE SUBORDINATES IN YOUR CREDIT UNION. Please circle one choice for each of the following three statements (1 - strongly disagree; 2 - disagree; 3 undecided; 4 - agree; 5 - strongly agree).

	Strongly Disagree			Strongly Agree
1. The more information the subordinate has the better he/she will perform	1	2	3	4 5
2. Information to a subordinate must only contain the facts and instructions that are related to his/her job	1	2	3	4 5
3. Information to a subordinate must always be simple and concise	1	2	3	4 5

VI. BEHAVIORAL AND COGNITIVE DEVELOPMENTS

Indicate the degree of change THAT BEST APPROXIMATES THE ACTUAL DEVELOPMENTS IN YOUR CREDIT UNION IN THE LAST THREE YEARS. Please circle one choice regarding the degree of changes (1 - approximately 10 percent decline/decrease; 2 - approximately 5 percent decline/decrease; 3 - no considerable change; 4 - approximately 5 percent improvement/increase; 5 - approximately 10 or more percent improvement/increase).

	Substantial Decline			Substantial Improvement
1. Adaptability to environmental pressures	1	2	3	4 5
2. Quality of services	1	2	3	4 5
3. Number of services offered	1	2	3	4 5
4. Technology of operations	1	2	3	4 5
5. Speed of operations	1	2	3	4 5
6. Introduction of new marketing approaches	1	2	3	4 5
7. Average productivity of employees	1	2	3	4 5
8. Turnover of employees	1	2	3	4 5
9. Satisfaction of employees	1	2	3	4 5
10. Overall atmosphere	1	2	3	4 5
11. Personal communication between top managers and employees	1	2	3	4 5

	Substantial Decline			Substantial Improvement
12. Team meetings' efficiency	1	2	3	4 5
13. Employees' level of understanding of credit union's strategic orientation	1	2	3	4 5
14. Employees' level of understanding of major problems in the credit union	1	2	3	4 5
15. Efficiency of information systems within the credit union	1	2	3	4 5

VII. ORGANIZATIONAL PERFORMANCE

Rate HOW IMPORTANT THE FOLLOWING MEASURES OF ORGANIZATIONAL PERFORMANCE ARE FOR YOUR CREDIT UNION. Please circle one choice for each of the following measures (1 - of little importance; 2 - not important; 3 - somewhat important; 4 - important; 5 - extremely important).

	Of Little Importance			Very Important
1. Capital/total assets	1	2	3	4 5
2. Total loans/total shares	1	2	3	4 5
3. Delinquent loans/total loans	1	2	3	4 5
4. Net income/total assets	1	2	3	4 5
5. Operating expenses/total assets	1	2	3	4 5
6. Fees & charges/gross income	1	2	3	4 5
7. Rate of asset increase	1	2	3	4 5
8. Rate of membership increase	1	2	3	4 5

Now indicate HOW SATISFIED ARE YOU WITH ACTUAL ORGANIZATIONAL PERFORMANCE RESULTS COMPARING TO YOUR EXPECTATIONS. Please circle one choice for each of the following measures of organizational performance: 1 - very dissatisfied; 2 - somewhat dissatisfied; 3 - neutral; 4 - somewhat satisfied; 5 - very satisfied.

If possible please indicate your actual values of performance measures as for June 30, 1993 in the right hand column.

	Very Dissatisfied			Very Satisfied	
1. Capital/total assets	1	2	3	4 5	_____ %
2. Total loans/total shares	1	2	3	4 5	_____ %

	Very Dissatisfied	1	2	3	4	Very Satisfied		
3. Delinquent loans/total loans		1	2	3	4	5	_____ %	COMMENTS Please feel free to make additional comments or suggestions regarding the content of this questionnaire. _____ _____ _____ _____
4. Net income/total assets		1	2	3	4	5	_____ %	
5. Operating expenses/total assets		1	2	3	4	5	_____ %	
6. Fees & charges/gross income		1	2	3	4	5	_____ %	
7. Rate of asset increase		1	2	3	4	5	_____ %	
8. Rate of membership increase		1	2	3	4	5	_____ %	
VIII. BACKGROUND INFORMATION								
1. Please indicate: a. total asset size as of June 30, 1993 \$ _____ b. membership as of June 30, 1993 _____ c. number of years as CEO (general manager) _____ d. number of full-time equivalent employees _____ e. total hours spent in training and education per month _____ f. total amount spent in training and education per month \$ _____								
2. Indicate the type of credit union is primarily (Please circle): a. occupational b. associational c. residential d. _____								
3. Type of charter (Please circle): a. federal b. state c. (other) _____								
4. Years in existence: _____								
5. Type of location of your credit union (Please circle): a. rural b. suburban c. urban d. (other) _____								
It may prove necessary to seek additional information, so we would appreciate knowing the name of the individual responsible for completing this survey. Your name: _____ Your title: _____ Your telephone number: (_____) _____ <i>Thank you for your cooperation.</i>								

APPENDIX G

Results of variance inflation factors (VIF) and
tolerance values (TV)

Variable	VIF	TV
Hypotheses 1-4:		
ENTUR	1.011	.988
INTENT	1.063	.940
ORGOPEN	1.063	.940
Hypothesis 5:		
NONDISP	1.104	.905
INDSPEC	1.136	.879
MEDRICH	1.121	.891
Hypothesis 6:		
COGNIT	1.870	.534
BEHAVE	1.824	.547
ASSET	40.154	.024
MEMBER	17.674	.056
CEOY	1.518	.658
YEARS	1.630	.613
TH	2.278	.438
TAM	15.885	.063
SHARE	3.045	.328
COGNIT	1.606	.622
BEHAVE	1.586	.630
TYPED	1.028	.972
CHARTD	1.011	.988
LOCATD	1.053	.949