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# The Role of Metaphors in Strategic Information Systems Planning

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**ABSTRACT:** This paper posits that (1) metaphors perform a crucial role in enacting strategy and linking strategic thinking with IT planning; (2) the war metaphor, which underlies many previous discussions of strategic information systems (SIS) is inadequate, possibly obsolete, in today's environment, and the shift away from this metaphor in the past few years is evidence of this; (3) other metaphors offer potentially more useful foundations for strategic thinking and SIS planning in today's world than the war metaphor; and (4) explicit articulation and exploration of alternative metaphors help identify strategic opportunities for information technology (IT) applications, designing SIS for global enterprises, and formulating research on SIS issues. This paper outlines these arguments and identifies desirable characteristics of metaphors, and discusses alternative metaphors of the organization as: an adapting organism, city-state, participant in organized team sports, an expression of philosophy, and expression of economic forces. The paper concludes with suggestions for research on the use of metaphor in strategy formulation and IT planning.

**KEY WORDS AND PHRASES:** strategic information systems, strategic MIS planning.

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"Then you should say what you mean," the March hare went on.  
 "I do," Alice hastily replied; "at least—I mean what I say—that's the  
 same thing, you know."

—Lewis Carroll

I speak Spanish to God, French to men, Italian to women, and Ger-  
 man to my horse.

—Charles V

## Introduction

IN EFFORTS TO COMMUNICATE IDEAS AND CONCEPTS, the language and vocabulary used in the communications process can make a difference in the effectiveness of the communication and the outcome of the process. This paper examines the central role of metaphors in the cognitive aspects of strategy formulation and strategic information system (SIS) planning. It argues for an examination of the metaphors underlying our discussions of SIS planning and research. Through such an examination, we can better understand the strengths and limitations of the cognitive structures fundamental to communication and understanding.

The use of information technology (IT) to change the basis of competition [33] has intuitive appeal, and there are numerous examples of information systems that proved valuable to the organizations that developed them. A considerable body of literature has developed over the past several years around the concept of SISs, information systems that are supportive of an organization's strategy or that change the basis of competition in an industry. However, these discussions are far from complete in setting forth principles for identifying SIS opportunities, and problems persist in linking the use of IT to organizational strategy in consistently effective ways.

This paper posits that (1) metaphors perform a crucial role both in enacting strategy and in linking strategic thinking with IT planning; (2) the war metaphor, which underlies many of the previous discussions of SIS, is inadequate, possibly obsolete, in today's environment, and the shift away from this metaphor in the past few years is evidence of this; (3) alternative metaphors offer potentially more useful foundations for strategic thinking and SIS planning in today's world than the war metaphor; and (4) explicit articulation and exploration of alternative metaphors can help identify opportunities for strategic IT applications, design SISs for global enterprises, and formulate research on SIS issues.

The following paragraphs summarize the rationale for investigating metaphors in order to understand strategy formulation and enactment, review key themes of the SIS literature and note the changes over the last few years, and summarize the potential value of alternative metaphors for global enterprises, a primary domain of interest.

The next section proposes two sets of factors that should be considered in evaluating alternative metaphors: environmental factors (with which metaphors should be consistent), and metaphor characteristics that are desirable for strategic thinking and SIS planning in global enterprises. Next, several alternative metaphors are discussed: the organization as an adapting, evolving organism; a "team game" viewpoint of com-

petition; the organization as a city-state; the organization as an expression of philosophy; and economic metaphors. The final section summarizes the case for an explicit consideration of the particular metaphors used in discussions of strategy and IT applications and suggests potentially valuable directions for research.

### Language, Metaphors, and Strategy Enactment

THERE HAS BEEN CONSIDERABLE EXPLORATION of how language, in representing concepts, shapes our view of the world. It has been hypothesized (the Sapir-Whorf hypothesis) that individuals from different cultures actually perceive the world differently because their language enables them to express concepts in particular ways [6]. More recently, the interdependent relationships among language, cognition, knowledge, and action have been discussed from the viewpoint of constructivism [37, 44]. In this view, language is not a literal representation of an objective reality or a one-to-one mapping of linguistic concepts to an objective reality, as implied by the Sapir-Whorf hypothesis. Instead, people use language to construct a reality that is appropriate for their setting. In Weick's terminology, a reality is "enacted" [44] through this process of communication and action.

Mintzberg and Waters [35] and Ansoff [1] hold the viewpoint that appropriate organizational goal(s) emerge from a process of social interaction among the stakeholders. An organization, as an evolving, inquiring system, discovers and enacts its purpose through this process of communication and action. An organization defines (makes sense of) its environment and enacts its strategy through this complex interplay of communication among its stakeholders. The language and mental concepts used by the stakeholders are critical in determining the goal that emerges from this process. The organization's strategy is *realized* as either a *deliberate* strategy (realized as intended) or an *emergent* strategy (realized despite, or in the absence of, an intended strategy) through this communication and sense-making activity [35].

Metaphors—as nonliteral figures of speech in which a word or phrase denoting one concept is used in place of another, more literal, description—perform crucial roles in communication and therefore in this enactment process. These roles are particularly crucial when the enactment is taking place in a changing environment. Lakoff and Johnson [25] and others ascribe key functions to metaphors in the process of linguistic evolution, communication, and sense making. Lakoff and Johnson note,

Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature. . . our concepts structure what we perceive. . . the way we think, what we experience, and what we do every day is very much a matter of metaphor.

Metaphors may be viewed as representations of underlying cognitive structures. In this view, systems of metaphors emerging from sentence-level "root metaphors" [37, p. 4] can become an implicit part of the vocabulary and language we use to communicate thoughts, formulate actions, and enact strategies. For example, speaking of an unauthorized program embedded in a computer operating system as a "dormant

virus" is the root for a system of metaphors that address the problem of "contaminated systems," the "epidemiology" of the geographic and electronic distribution of the unauthorized program, software for "virus diagnosis" and system "inoculation," etc. Such systems of metaphors provide conceptual frameworks around which we express ideas and within which we interpret the results of our actions. Once established, these systems resist the major shifts in viewpoint and language (the "paradigm shifts" described by Kuhn [24]) necessary for the adoption of new ideas and concepts.

With further elaboration, such systems can become models [3], providing more explicit foundations for empirical testing of the predictive power of the concepts. Even without such elaboration, the metaphors may facilitate or inhibit how we define problems and articulate issues. Such constraints can be critical in the early stages of discussion about opportunities for strategic applications of IT and in the design phase of information systems that represent significant departures from conventional IS functions.

If we adopt the constructivist perspective described by Weick, and the enactment viewpoint of strategy formulation described by Mintzberg and Waters, communication becomes an influential mediating, if not dominant, factor in the process by which organizations enact strategy. Metaphors serve four important roles in this communication and strategy enactment process.

First, metaphors provide a way to encapsulate features of a situation or process and communicate these aspects to others without having to spell out all the details [44]. In so doing, metaphors enable efficient communication. The example of a software system "virus" conveys the notion of a causative agent and a contagious disorder that, if not detected and treated, can spread. If one wants to communicate the essential character or performance of a manager, use of the term "racehorse" communicates a very different set of expectations than the use of the term "workhorse."

Second, metaphors perform a significant role in providing a conceptual framework and vocabulary in new situations, settings in which there is little or no previous experience. In these uses, metaphors serve what Black [3] terms a catachrestical function: they bridge a vocabulary gap in a new or emerging area of inquiry. Langer [26] notes that metaphors are used to express new ideas, thus enabling languages to embrace a multimillion things, "whereby new words are born and merely analogical meanings become stereotyped into literal definitions." Metaphors are used in this sense to communicate across disciplines and to explore new fields. (Fluid flow terminology was used in the early days of electrical circuit analysis and some terms persist today in discussions of electricity: current flow, valves, etc.) A metaphor enables a naive observer to organize experience and observations in terms more familiar because of past experience and knowledge. The observer can formulate propositions in the unknown field by using what is known about a better-known field. The metaphor, by providing a rudimentary model of experience and expectations, provides a test of reasonableness for the new observations and experiences.

Third, metaphors promote understanding by requiring active engagement in the communication process. Unlike analogies, in which there is presumed to be a one-to-one mapping of concepts [15], metaphors do not explicitly state the relationship; the



relationships are implied and depend more heavily on the interpretation, knowledge, and experience of the person reading or hearing the metaphorical phrase or statement. The use of metaphor in cognition is closely aligned with the use of what Kelly [23] called "personal constructs," mental models of the environment that are used to make judgments about possible actions based on the expected consequences of these actions. The person hearing the metaphor is called on to compare it with his or her experience and to understand, from this context, the meaning of the metaphor. Precisely because it is unfamiliar, a new metaphor elicits a reaction from the recipient: is this consistent with my experience, even though I have not expressed it this way? For example, "distributed systems are the democratization of computing power" provokes thinking about what the implications of a "democracy" of computing power might be. In this role, metaphors are a basis for developing shared understandings (knowledge); they are not simply a means of communicating explicit ideas.

Finally, because of the same characteristics that enable us to comprehend one concept in terms of another, metaphors necessarily "highlight" some aspects and "hide" others [25]. A particular metaphor focuses our attention on particular characteristics, attributes, or issues; it diverts our attention from other attributes and issues. Someone speaking of the return on investment of a new application of IT highlights issues of capital and operating costs, revenues generated, etc. The economic metaphor does not emphasize issues of organizational structure, empowerment of individuals, possible changes in strategy, organizational learning or implications for work force hiring and retention, except as these are reflected in cash flow measures.

Through these four roles, metaphors exert powerful influences on how problems are defined and solved. Metaphor has been shown to be important in selecting and describing problem solutions, identifying solutions from which to choose, and stimulating creative thinking [4]. Gentner and Gentner [14] showed that even misconceptions in a mental model (a more explicit elaboration of a metaphor) are transferred into new domains. Wozny [47] noted the importance of metaphors in designing computer interfaces and the value of metaphors in transferring knowledge from one domain to another. These studies illustrate both the enabling or creative value of using metaphors to think and communicate about problems *and* the constraining and limiting aspects once a metaphor becomes embedded in the vocabulary used to describe or conceptualize a problem.

Given this powerful influence of metaphor on the organization's social process of "sense-making"—specifically through the third and fourth roles above—Pondy [40] has argued that the primary role of top management is to manage the use of language and meaning as the participants observe, selectively devote attention to particular aspects of, and act within, their environment.

In summary, metaphors and the language that accompanies them are important not only as a means of expressing and communicating about a problem or observation, but, in addition—since the participants construct the problem and decide on goals and "reality" through a kind of consensus-building process—the metaphor itself is a fundamental determinant of how the world is viewed. It determines what is observed, which aspects are given attention, and which aspects are ignored.

## SIS Concepts: Limitations of the War Metaphor

THE MILITARY METAPHOR HAS DOMINATED WESTERN BUSINESS THINKING [44] for years. It is not surprising that early discussions of strategic information systems viewed the use of such systems from a military perspective. Today, the war metaphor is both less pervasive and, it can be argued, less useful than it might have been several years ago.

Early SIS benefits were described in military terms. Guidance on how to identify opportunities for SISs, design them, and manage their implementation often were described in military terms. Writers noted that these systems could have major impacts such as changes in the nature of competition [33] and redrawn competitive boundaries [7]. The extreme of the military theme, with the underlying war metaphor, was articulated by Wiseman and others, who spoke of "competitive weapons" [39, 46] and "competitive options" [45]. Wiseman and MacMillan described an organization's competitor as "target"; they categorized the opportunities for IS as "offensive" or "defensive." In his 1985 book, Wiseman compares SISs to strategic weapons and suggests setting up the equivalent of a "strategic air command" or "joint strategic target planning staff." Trade press articles emphasized the same theme (e.g., "Guerrilla Warfare; Strategic IS in the Real World," *Information Week*, May 9, 1988, p. 40).

Discussions of SIS began with the prospect of the SIS implementer having the prospect of achieving a sustainable competitive advantage over the competition [9]. Management information system (MIS) managers probably have grown weary of hearing about the systems often cited as premier examples of such strategic systems: American Airlines' Sabre reservation system, Citibank's ATM, and American Hospital Supply's ASAP inventory information/ordering system. These and later systems such as McKesson's "Economost" illustrated what seemed to be a fundamental truth: IT, properly designed into an SIS, would enable the innovator to enjoy this "sustainable competitive advantage." The competitive advantage in these systems included concepts from Porter's competitive strategy model of a "barrier to entry" into the market being served, greater power over suppliers, and increased switching costs for customers.

Despite these early discussions based on use of the war metaphor, recent discussions illustrate the shortcomings of this framework. There are increasing concerns about the long-term benefits of SISs, the process by which we identify SIS opportunities, and how we design and implement these systems. Three major issues are evident. First, some of the original assumptions about SISs are being questioned; there have been problems realizing the benefits first envisioned from the military perspective. Second, there are pitfalls and dangers for the organization that designs and implements an SIS. Third, a reliable solution to the challenge of linking SIS planning to organizational strategy has proved elusive. A metaphorical framework other than the war metaphor might help resolve each of these issues.

There has been growing doubt that an SIS can ever provide a *sustainable* competitive advantage [8]. Many SISs that initially provided a competitive advantage have really turned into "strategic necessities" in which all competitors with comparable capabil-

ities and needs have developed similar systems. If an SIS can be duplicated and it is unlikely that there will be a *sustainable* advantage, then perhaps there are economies to be found in cooperating on the system's development and reducing the investment required [10].

The notion of cooperative information systems (which may indeed be strategic in their impact on the enterprise) is increasingly linked to structural and economic considerations in the firm [29]. In some cases, cooperation is viewed as a contingency strategy or economic expediency, an exception to the competitive paradigm. Even systems not motivated directly by considerations of competing organizations (e.g., systems such as electronic data interchange [EDI] and other interorganizational systems [IOS]) can have significant strategic implications for the organizations that implement them. In other cases, the notion of cooperation—even with some-time competitors—is taken as a viable strategy [22, 36].

A second concern has been the dangers associated with designing and implementing an SIS. At least three types of risks have been noted. Ginzberg and Moulton [17] note the need to manage the risks associated with implementing and managing large systems (both strategic and otherwise), especially distributed systems that have multiple users and less direct central control. Such systems come with an increased exposure to possible mistakes, and the consequences of these mistakes can be catastrophic to the implementing organization. One might think of these risks as the risks of errors in design, implementation, or integration with the other parts of the organization. A second type of risk is the risk of an SIS being duplicated by the competition [11, 43]. Developing an SIS may simply "awaken a sleeping giant" who, with superior resources, negates the initial advantage of the SIS. A third type of risk is the risk of "succeeding" with a system that is too narrowly defined or for which the consequences have not been fully recognized, or perhaps not even recognizing and taking advantage of an opportunity to apply IT strategically [16, 43]. (This latter risk is analogous to suboptimization of design or opportunity cost by missing an opportunity.) Again, a shift in metaphors may reduce the risks of suboptimization by enlarging the scope of the system being considered or stimulating a wider set of possible designs.

A third issue that might benefit from a different, more appropriate vocabulary is communication between top general managers and IS planners. The importance of this linkage, the scarcity of success stories, and low satisfaction with the process of SIS planning are well documented [12, 27]. Meyer [34] indicates that a formidable barrier to linking IS planning to strategic organizational planning is the relative satisfaction of top management with their conventional IS functions (98 percent satisfaction). MIS managers should break out of this satisfaction mindset and help build a culture of strategic value, one in which individuals throughout the organization contribute ideas for value-oriented implementations of IT. The key, Meyer argued, is to change executives' perceptions of the value of IS to help solve problems. Crescenzi [12] also argued that top management involvement, as one of seven organizational factors, is necessary for successful SIS implementation. He reported that of thirty SIS efforts studied in Fortune 500 companies, only five succeeded. Failures, he noted, are

attributable to organizational, not technological, reasons. Once again, one can argue that a shift in metaphorical framework would facilitate communication among IT specialists and top managers, thus reducing the gap between technical planning and corporate strategy formulation.

Finally, today's global environment exhibits several characteristics that lessen the value of war as a root metaphor and suggests the need for a different root metaphor for our discussions about SIS planning. These factors include:

- *"Fuzzy" organizational boundaries:* (a) an increasing number of companies are forming long-term alliances with suppliers, distributors, and complementary organizations; (b) many organizations take a minority equity position in startups and early stage companies in order to have access to advanced technologies or other capabilities; and (c) companies form joint ventures in order to conduct cooperative R&D programs or to cooperatively develop a new market area.
- *Complex and sometimes conflicting relationships among "competitors":* for example, the trade press—within a few weeks' time—ran different stories on MicroSoft and Apple (a) engaged in suits and countersuits over technology ownership and contracts, (b) competing in particular software areas, and (c) engaging in joint development of new software interfaces. Similar stories appear for other competing/cooperating firms. Other anecdotes reflect numerous situations where firms may be "competitors" but engage in trade, collaboration, or support for specific periods of time or in particular markets or product areas.
- *Information is unlike other consumer or industrial products:* information is not destroyed by someone's use of it; its value may be lessened by someone else's use of it, but not necessarily. In some cases (e.g., knowing the "rules of the road" for driving, technical standards, *de facto* interfaces), the value of the information is enhanced by others' having and using it. The value of an information system may be raised, not lowered, by additional users (e.g., a cooperative database of available products could make an economically more efficient market for commodities).

The war metaphor works best when boundaries are distinct, when one knows explicitly who is "us" and who is "them." The metaphor implicitly is consistent with the zero-sum game framework, where if one party wins, the other loses. It is particularly good where the players in the game generally align themselves with one of two distinct sides. It has less value and provides less intuitive guidance when the situation is characterized as a potentially positive-sum game or where there are multiple players in shifting or complex relationships. The war metaphor is not well matched with today's environment, an environment characterized by the potential for cooperation and multiple entities engaged in complex and changing relationships. The war metaphor sets up not only an inefficient, but also an ineffective, framework for discussing (discovering) strategies for the enterprise through the planning of significant enterprise-wide information systems.

From a systems design viewpoint, the war metaphor may provide feedback based



on inappropriate measures. For example, tracking "market share" may be inappropriate when a market is just beginning to emerge. Some CEOs would argue that it is inappropriate and dysfunctional even in mature, well-established markets. Yoshiro Maruta, president of Kao Corporation (Japan), for example, prefers to think in terms of how best to serve Kao's customers rather than comparing performance in terms of sales in previous periods or with rival companies' figures: "indulging in competition and share expansion is stringently ruled out in our corporation" [31].

It is timely to rethink how strategies are developed, how they are categorized, and how IT strategies and SIS planning are linked to overall business strategy. With the ending of the Cold War, discussions of strategic approaches based on the notion of competition as war and organizational structures primarily as military hierarchies seem out of date. Discussions using other conceptual frameworks can be more useful for both MIS managers and general managers as they think about IT opportunities and SIS designs, and such discussions may alleviate the concerns outlined above.

These issues are especially critical in applying IT to the design and operation of global enterprises, organizations that seek to serve global markets, may employ production or service facilities distributed worldwide, may utilize raw materials or components from around the world, and depend on a globally distributed base of knowledge and expertise.

## Evaluating Metaphors

IF ONE ACCEPTS THAT THE WAR METAPHOR is inadequate, possibly obsolete, in dealing with SIS planning in today's environment, some type of metaphorical framework still can be useful for linking IT planning to organizational strategy. If we were to examine other metaphors, we would look for two general characteristics. One is that they should meet a "reality test" and accommodate, in some sense, our observations of the environment. The second is that they should have pragmatic value: they should help identify opportunities for strategic applications of IT and help design such systems.

## Environmental Characteristics

Observations about trends and environmental characteristics, a synthesis of ideas, assumptions, and observations from recent literature, suggest several propositions about factors that should be included in present-day discussions about strategic information system planning and design.

- *Globalization*: An organization's environment is increasingly global. The global village is becoming more of a reality. Actions in one location often have impacts in other locations.
- *Diversity*: An organization increasingly deals with diverse markets, sources, and production locations. An organization increasingly is called on to coordinate the activities of individuals representing a wide range of cultural and ethnic backgrounds.

- *Complexity*: Relationships between an organization and its environment, including other organizations, are increasingly complex. Two or more organizations may simultaneously compete, cooperate, engage in joint ventures, share stock ownership, etc., and these relationships may change over time.
- *Cooperation*: Organizations are more frequently engaging in cooperative activities to take advantage of the specialized skills and capabilities of each.
- *Rising expectations*: Consumers and industrial customers are expecting more from organizations. If a better version of a product or service (higher quality, faster response) has been offered by someone, somewhere, then this becomes the level expected. This leads to a "ratcheting" of expectations, with product/service performance and quality expected to rise and never fall.

### Metaphor Utility

In seeking a language or metaphor other than the war and competitive-based one to discuss strategic information systems, we search for one whose features make it useful in two contexts: (1) in the organizational context, useful for top managers and IS managers to identify, plan, and design strategic information systems; and (2) in the research context, to suggest to academic and industrial researchers applied research questions that will lead to improved knowledge about how organizations may use IT effectively at the strategic level. Characteristics that provide this utility include:

- *Robust*: The language should not be so specialized that it loses its utility when it is applied in different organizational settings. It should have a high degree of face validity when moved from one organization to another.
- *Natural, uncomplicated*: The concepts should have broad appeal. They should enable top management and information systems managers to communicate and work toward a shared vision. The language should be drawn from concepts that are familiar to individuals from a wide range of educational backgrounds and—ideally—not require experience with a particular culture.
- *Stimulating*: The metaphor should stimulate creative thinking about the goals of the organization and the potential applications of IT. It should enable the participants in the strategy-forming process to make associations between and among previously remote facts. It should inspire an organization to seek a realizable vision that may exceed its current image of itself.
- *Deep*: The metaphor should enable managers and researchers to identify questions critical in today's environment. It should lead researchers to a research agenda and an effective approach to developing greater knowledge. It should assist in identifying potentially significant IT applications and lead managers, IS designers, and researchers toward successively more detailed problem formulations and solutions to today's problems.
- *Issues highlighted and issues hidden*: Lakoff and Johnson [25] point out that the systematic aspects of a metaphor that enable us to understand one aspect of a concept in terms of another necessarily hide other aspects. Thus, a particular

metaphor "highlights" some issues and aspects and "hides" others. In the war metaphor, for example, the win/lose aspect of market competition is highlighted, but the potential cooperative aspects of industrial participants are hidden. The metaphor should highlight issues that may be critical to the organization's current situation. The metaphor should not hide issues that might be strategic.

### Alternative Metaphors

THE ABOVE GUIDELINES CAN BE USED TO EXAMINE alternative metaphors that avoid some of the weaknesses of the war metaphor. The metaphor of the organization as an organism underlies many studies of organization and is discussed in a wide range of research reports. Other metaphors have been explored to a lesser extent. Table 1 (following the discussion below) summarizes the alternative metaphors by comparing them in terms of (a) issues highlighted, (b) issues hidden, (c) the role of competition, and (d) the role(s) of information technology and information systems.

### The Organization as an Evolving, Adapting Organism

The word "organization" and the many words relating to living systems (organism, organic, etc.) have a common root, from the Greek, *organon*, tool or instrument. There is a long history of writers using this common root to apply the organismic metaphor to investigate the growth, development, and management of organizations [2, 18, 28].

Mason [32] synthesized Bennis's [2] notion of organizational health, Boulding's hierarchy of systems [5], and strategic planning concepts. He suggested an integrated systems model for strategic planning, noting the need for systems at each of Boulding's levels in order to have a healthy organization. Mason extended Bennis's health metaphor in a systems model that suggests an approach to identifying an organization's needs similar to Maslow's hierarchy of individual needs. According to this view, an organization must meet needs at each level. Only when the more basic (lower in the hierarchy) needs are satisfied does the organization direct its efforts to higher-order needs. In using this metaphor, the highest function of an organization (the strategic function) is to *discover* and *realize* its own unique capabilities, those capabilities that enable it to make its greatest contribution to society and thereby achieve its greatest satisfaction. Distinction is achieved through this discovery and enactment rather than by (as in the war metaphor) "winning" in the marketplace.

More recently, Huber [19] and Huber and McDaniel [20] discussed postindustrial, "intelligent" organizations. The basic notion is that organizations that are to survive in the environment of the postindustrial age will exhibit certain characteristics and will shift to a decision-making paradigm of organizational design. Huber and McDaniel argued that an environment characterized by increasing turbulence, complexity, and knowledge requires a more complex decision-making apparatus, thus the need for organizations to follow a set of guidelines that they list. The metaphor underlying their concept is that of a living organism that survives, learns, adapts, evolves, and thrives in an ever-changing environment.

Table 1 Comparisons of Alternative Metaphors

<u>METAPHOR</u>	<u>ISSUES HIGHLIGHTED</u>	<u>ISSUES HIDDEN</u>	<u>ROLE OF COMPETITION</u>	<u>ROLE OF IT/IS</u>
WAR	<ul style="list-style-type: none"> <li>o zero sum game</li> <li>o winning (losing) in the marketplace</li> <li>o us/them; conflict</li> </ul>	<ul style="list-style-type: none"> <li>o cooperation</li> <li>o complexity of relationships</li> <li>o growth, renewal of societal quality of life</li> </ul>	<ul style="list-style-type: none"> <li>o determine a winner</li> </ul>	<ul style="list-style-type: none"> <li>o develop sustained competitive advantage</li> <li>o erect barriers to competition</li> </ul>
EVOLVING, ADAPTING ORGANISM	<ul style="list-style-type: none"> <li>o increased knowledge, understanding</li> <li>o complex, interdependent relationships</li> <li>o hierarchy of needs</li> </ul>	<ul style="list-style-type: none"> <li>o deliberate threats</li> </ul>	<ul style="list-style-type: none"> <li>o compare performance and increase knowledge</li> </ul>	<ul style="list-style-type: none"> <li>o enable environmental sensing</li> <li>o acquire, store, and access knowledge</li> <li>o increase effectiveness of knowledge utilization</li> </ul>
CITY-STATE	<ul style="list-style-type: none"> <li>o complex, changing relationships</li> <li>o commercial activities</li> <li>o social good</li> <li>o civic pride, duty</li> </ul>	<ul style="list-style-type: none"> <li>o competition</li> <li>o details of implementation</li> </ul>	<ul style="list-style-type: none"> <li>o ambivalent, multiple roles</li> <li>o determine relationships among entities (?)</li> </ul>	<ul style="list-style-type: none"> <li>o intelligence function</li> <li>o monitor trade activity, balance flows</li> </ul>
PHILOSOPHY	<ul style="list-style-type: none"> <li>o societal quality of life</li> <li>o truth, beauty in working with nature</li> </ul>	<ul style="list-style-type: none"> <li>o individual purposes</li> </ul>	<ul style="list-style-type: none"> <li>o improve knowledge, self-awareness</li> </ul>	<ul style="list-style-type: none"> <li>o enable enactment of philosophic values</li> </ul>
MARKET	<ul style="list-style-type: none"> <li>o free market mechanism</li> <li>o life cycle of organization</li> </ul>	<ul style="list-style-type: none"> <li>o individual purposes</li> <li>o vision and leadership</li> </ul>	<ul style="list-style-type: none"> <li>o natural selection</li> </ul>	<ul style="list-style-type: none"> <li>o industry-level market indicators</li> </ul>
TEAM SPORTS	<ul style="list-style-type: none"> <li>o cooperation within teams</li> <li>o cooperation for league play</li> <li>o coordination and specialization</li> </ul>	<ul style="list-style-type: none"> <li>o market influence on team "strength"</li> <li>o social values</li> <li>o implementation details</li> </ul>	<ul style="list-style-type: none"> <li>o test of preparation</li> <li>o stimulate improvement</li> <li>o enjoyment</li> </ul>	<ul style="list-style-type: none"> <li>o score keeping</li> <li>o improve play, resource allocation</li> <li>o input to "game planning"</li> </ul>



The metaphor of an "intelligent organization," a purposive, goal-seeking, adapting, and evolving open system, suggests particular roles for an information system for such an organization. The information system would focus the organization's attention on what the organization might become and would help the organization to realize (actualize) this vision. That is, the information system would enable the organization to become all that it is capable of becoming in the Maslow sense. Such an information system might be termed an "actualizing information system" (AIS). Functionally, an AIS might operate as the sensory, perceptual, and cognitive system for the organization. It would comprise the system through which the organization's participants enacted a strategy by being aware of events and facts in the environment, selectively devoting attention to them, making sense of them, and selecting and carrying out courses of action.

Paradice [38] outlines such an "intelligent information system" for an organization, one that "behaves in a manner which (actively) assists an organization in fulfilling its purpose." Paradice emphasizes the role an IS can perform in environmental scanning, an acknowledged aspect of strategic planning, and notes the increasingly important role of memory in such systems as the need to anticipate environmental changes becomes more critical.

The organismic metaphor is free of many of the constraints of the language of the war metaphor. It has many of the desired features of an improved framework for thinking about strategic information systems. It is robust and not dependent on a particular type of organization. It may, however, be culturally dependent and might not translate well from one society to another. This metaphor is uncomplicated in its elemental form; virtually everyone can identify with it. Most managers have had the background to understand the key concepts on which it is based. It is less prescriptive than one might like, since it emphasizes process and does not provide detail on how an organization measures its progress toward actualization.

The adapting, evolving organism metaphor highlights the individuality and self-identity, and the continual evolution of the organization's sense of self. It highlights the notion of "organizational role," the set of consistent and interdependent actions through which an organization interacts with other organizations in its environment.

The notions of an intelligent organization and an intelligent information system or AIS suggest that IT planners think of developing an SIS that gathers, analyzes, and presents information that will enable organizational stakeholders (participants in the enactment of the organization's strategy) to identify and pursue sets of actions worthy of the organization's capabilities. For example, the organization might define itself through particular sets of actions ("organizational roles"), a set of mutual responsibilities, relationships, and expected behavior in association with other organizations. In such a case, the SIS would monitor measures of these relationships and provide information that would enable the stakeholders to determine how well the role is being fulfilled. For example, if an organization is enacting a strategy of being a technical leader for a particular market, then the SIS would enable stakeholders to compare its technology with others available to that market.

This metaphor hides the sometimes inconsistent, divergent activities of individuals

who make up the organization. It hides the aspects of internal decision-making processes that might otherwise be described in terms such as (internal) "politics" and personality differences among the stakeholders.

### Organizations as City-States/Countries

The city-state metaphor is suggested by one of the limitations of the war metaphor. Countries (or, earlier, city-states) may exercise options other than war in their relationships with other countries (other city-states). This view has not been explored adequately in the literature. It appears to be reasonably robust and simple, and stimulates different views of the role of IS and IT.

The complex relationships among firms in today's global environment may resemble the complex, shifting diplomatic relations among countries. A city-state image has somewhat more appeal, since city-states were more contained and arose primarily because of commerce. This metaphor raises issues of civic pride and civic duty, social good, reciprocity, treaties and alliances, rights and obligations of the citizens, and governance.

In such a metaphor, there are several possible roles for IT and SISs. One—drawing from both the war and diplomacy metaphors—is that of intelligence operations. Even in times of competition (war), the intelligence operations of the warring countries maintained a relationship that included both the competitive and the cooperative aspects. In many cases, evaluation of the benefits of the intelligence operations cannot be measured easily in economic terms. Taken to an extreme, the "currency" of trade between information systems becomes the information content itself.

Another SIS role suggested by this metaphor is the monitoring of economic flows. In older commercial activities, this function is performed by banks serving as clearinghouses for the standard of exchange, thus facilitating the shifts in value of goods and services over time.

Still another role suggested by this metaphor is that of providing information on citizen satisfaction as input into the governance and decision making, and keeping the citizens informed of actions and opportunities that may affect them. If the stakeholders in the system (citizens) are critical to its existence and make choices (e.g., as in a republic or representative democracy), then keeping them informed is crucial to effective governance and decision making.

This metaphor, by highlighting the independence of city-states, may hide critical dependencies among organizations. Some organizations, by being closely linked in the value chain, may not be fully characterized by the more diverse commercial linkages implied by the city-state metaphor.

### The Organization as Philosophy in Action

The view of the organization as philosophy in action is suggested by Maruta [31], who speaks of his role as president of Kao in terms of applying the principles of "two great thinkers of Japan." One of these thinkers is Prince Shotoku, a regent of Emperor Suiko

(about 710 A.D.) who was "profoundly learned in Buddhism," particularly the Lotus Sutra, which holds that there is an inviolable truth in the world and that there should be no discrimination among individuals—the dignity of every individual is equal. The other great thinker is Zen Master Dogen (about 1290 A.D.), whose writings acknowledge the existence of an inviolable truth in which the highly complex arrangements of nature, if only we could see them in totality, would be understood. Dogen's writings encourage individuals to engage in "religious practice with all our heart and being." This requires that at every moment, regardless of the activity, the individual carry out the activity wholeheartedly, removing false and evil thoughts. By doing this, the individual is able to "look at things from the universe's side, from nature's side . . . and understand the arrangement and order of the universe."

Maruta continually strives to apply these principles to business management, stating that "success in business is not based on motives such as greed and profit, but is due to the ability of a large number of persons to perceive the working of the universe and nature, and their ability to unite these insights into one force." For Maruta, this means rejecting competition and the accompanying measures of success, such as market share.

Maruta's description of the information system of Kao indicates that it appears to be similar to what other writers would encourage firms to have in order to share information internally and to remain "close to the customer." While the philosophic grounding may be strange to someone trained in Western schools, the results have a lot in common with organizations based on other philosophies. Might there be what in effect is a "spindle" syndrome [41], in which multiple approaches to an issue (in Porter's parable, individuals trained in different disciplines) yield the same solution? The philosophy-based metaphor can be robust, but different cultures may react differently to different philosophies. It is uncomplicated and nondirective. It stimulates creative thought, highlights issues of moral obligation, opportunities for service, and the discovery of truth and beauty by being in harmony with the universe. It does not demand a particular organizational framework.

### The Organization as an Expression of Market Forces

An economics viewpoint, either with the development of a resource allocation framework or with a mixture of models, has been proposed as a useful perspective for understanding the relationships among industry structure, value added by an SIS, and the opportunities for developing an SIS. Marsden and Pingry [30] take an economic market perspective and suggest that the Huber-McDaniel guidelines [20] are based on some assumptions that should be treated as hypotheses, subject to empirical confirmation. They raise issues of environment taxonomies and the changes from environment to environment for a "competitive" firm, and challenge the fundamental assumption of "survival of the firm." Their approach changes the basis of analysis from the individual firm to industry structure. At the extreme, this viewpoint takes a kind of Darwinian "survival of the fittest" approach, which to some would overstate the case.

Other writers have suggested other economic frameworks and models. A full discussion of metaphors based on economic perspectives, however, cannot be covered in this paper, although we can note that, in the economic market concept, the firm need not be the unit of analysis. The unit of analysis may be the industry or "strategic group," and the firm is a product of (i.e., results from) economic forces within this industry. "Survival of the firm" may not be an imperative; economic efficiency for society in the creation, operation, and dissolution of firms becomes the important consideration.

From such a perspective, an information system would enable management to understand the full societal cost of delivering products and services under alternative arrangements. There would be a kind of competition, but not competition with some other firm or firms. The competition would be to match or improve "best practice" or to work toward some known theoretically achievable objective. A strategic information system in this frame of reference would be embedded in the market itself, which reflects signals of organizational life cycles (emerging companies, growth, decline).

This metaphor highlights issues of free markets and managed markets, private and public benefits, economic measures of societal success, the value of the whole enterprise compared with the sum of the values of its parts (or the value of some other arrangement of its parts). This metaphor requires further exploration of what information should be collected and analyzed. One difficulty with this metaphor is engaging managers in a discussion in which the survival of the firm is *not* a basic goal.

### Organizations as Sports Teams

The sports metaphor has been widely used in informal ways in motivational settings and to describe individual emotional reactions to participating in an organized effort. Much of the use of this metaphor, it has been argued [42], can be attributed to the socialization of males in the United States. As young boys, men participated in competitive team sports, both formally and informally, and the metaphor may be more in keeping with a "masculine vocabulary."

This metaphor highlights the issues of competition and excelling—excelling as an individual, to be sure, but more importantly, as a team in comparison with other teams. Keeping track of who wins and who loses is valuable in that it provides feedback on how to better one's own play. There is a striving to improve, to "outprepare" the opponent. In most organized team sports, there are winners and losers of individual games, series, and special tournaments, but there is little sense of a "zero-sum" game mentality. Everyone wins, in a sense, and the "organized" aspect of playing means that the teams are engaged in a cooperative endeavor.

Deviations from this structure for the competition are not welcomed. Recently a top manager in a consumer product company expressed his concern that a competitor might be going out of business. "If he does, it will change the whole game. We don't know who we might be competing against. I'd much rather deal with ———; I know how they are organized and how they will react to what we do; I would have to learn about a new player." The game metaphor is apparent in this manager's thinking, as is a very specific, mutually beneficial, concept of competition.



This metaphor suggests two different types of roles of IT and SISs. In one, the IT manager is a team player, performing a specialized role in what may be a highly interdependent set of activities. The SIS in this internally oriented view assists the team in performing; the SIS supports the chosen strategy by providing detailed information on the capabilities of the other team, "scouting reports" on performance of individual units, thus enabling predictions of reactions to particular strategies.

Another view of the role of IT and an SIS is to support the organization of the sport. In this leaguewise (i.e., industrywide) view, for example, an SIS might provide the means for efficient and widely accepted "score keeping" data that may be shared by all teams. This shared information base (e.g., data on total market size by segments) would not provide a competitive advantage to any one team, but it would support each team's strategy by enabling the formulation of strategies and plans and providing feedback on the impact of enacting these strategies. These types of systems are similar to the "strategic necessity" systems suggested by Clemons and Knez [10]—applications of IT in which cooperative development makes sense.

This metaphor hides issues associated with the zero-sum game aspects of competitors who seek to serve a fixed or declining market. It may also hide the nature of some aspects of interaction among stakeholders at different levels in a hierarchy and the top-down decision-making prevalent in some organizations. Public companies typically have numerous owners; sports teams typically have one or a few.

### Concluding Remarks

IN EXPLORING THE POTENTIAL USES OF IT AND IS at the strategic organizational level, we must recognize the central role of the vocabulary we use. Not only must we mean what we say, we must say what we mean in ways that communicate possibilities for action. If an organization's strategy arises from a shared sense of reality, and this in turn depends on communication among organizational participants, the language used should be worthy of the organizational possibilities.

The war metaphor so pervasive in discussions of strategic applications of information technology has significant limitations for strategic information systems planning. It is not evident that a single metaphorical framework is adequate, but a range of other metaphors offers improvements over the war/zero-sum game framework.

In performing research on "strategic information systems," we should no longer take for granted the forms embedded in the language we use to describe our research. Particular research issues include:

- *Comparison of metaphors and language imagery used by top management and top MIS managers.* Are the metaphors and languages consistent and aligned? If not, might this be the first step in linking top management planning with IS planning?
- *Comparison of metaphors used by different firms as they have planned their information systems.* Are there associations between top management judgments of success of an implemented system and the metaphors used in their planning?

Is there empirical evidence that one metaphorical framework is more effective than another for successfully implementing an SIS?

• *Single metaphor use versus a series of frameworks or a "metaphor-rich" planning process.* For those firms that are acknowledged to have successful companywide or strategic information systems, was the planning and designing guided by a single metaphorical framework or did top managers and planners participate in a richer communications process, changing metaphors over time? Evidence of frame-of-reference "switching" has been shown in groups tracking strategic issues [13]. Is there evidence that metaphor shifts or metaphor-rich discussions (or both) are associated with either higher-quality strategy enactment or more efficient realization of a strategy?

In our study of the relationship between information systems planning and strategic planning for the organization, we should be alert to the barriers to assuring alignment. Not only can proper choice of the vocabulary used in the planning framework reduce these barriers, but the conceptual framework embedded in the language can inspire all the participants in the planning process to visualize the full range of possible applications of information technology.

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