CHAPTER 1

ORGANIZATION MODELING

1.1 GROPING IN THE DARK

Change is everywhere—global competition, mergers and acquisitions, strategic alignment, teams, knowledge management, the Web. How about decision making with seemingly insufficient information—or is it too much of the wrong information? And let's not forget young knowledge workers who know more than their managers—about work *and* management. Oh, yes, how about innovative culture—what's that, anyway? And what is the manager with an MBA to make of Michael Porter's strategic positioning concepts—low cost, differentiation, and niche—when Japanese manufacturers do all three at once? And what is the relationship between culture, information, competitiveness, and all the rest? The questions never end.

It seems bewildering. Organizations respond to these management philosophies of position with yet other management philosophies of action: business process transformation, organizational learning, downsizing, object-oriented development, restructuring, and so on. A few initiatives may work for a time with certain companies, still others for other companies. Most will only marginally improve an organization's effectiveness.

Change is seldom coordinated. Management rewards people as individuals, yet expects teams to flourish. Management introduces a quality or learning initiative, and then deliberately staffs its organizations with disaffected, short-term employees. And why does management expect a healthy culture when the only *real* stakeholders are they and the shareholders? Each of us has observed this random and inconsistent approach to management—a great deal of activity with little progress and almost no chance for success.

SEARCHING FOR DISCIPLINE

To avoid the pitfalls associated with haphazard decision making, management sometimes systematizes its approach to change. There are "change" models, "decision-making" models, and so on—each a step-by-step procedure leading the manager through the "process of change." The results are questionable. In practice, such procedures provide only a tactical focus, producing little of enduring value.

Other organizations try a more strategic approach—they seek to provide a framework or architecture that gives coherence to decision making. But which architecture? Is there a modeling framework of the organization to which management may refer? Every day we see another "business," "enterprise," or "organization" model put on the auction block. Why has none claimed victory?

As an example, let us examine the primary force behind organizational change: information technology (IT). At one time, management had tremendous faith in the IT professional to produce architectures that would really work. Remember information engineering and all those "enterprise models" that cost millions of dollars and took months, sometimes years, to construct? Have they produced effective information systems?

In a classic paper, "Experiences in Strategic Information Systems Planning," Earl (1993) has shown that technology-driven (e.g., information engineering) and methodology-driven (e.g., Method/1) approaches to information systems (IS) planning confer relatively little competitive advantage. These weak approaches are formalized in the sense that they impose a structure and a degree of rigor. They use highly technical constructs such as data flow diagrams, and, not surprisingly, are popular with IT professionals. In contrast, the most successful approaches to IS planning are those that make IT professionals uncomfortable: They are the "soft" organizational approaches that emphasize teams and learning in place of technical artifacts.

Perhaps our expectations are misplaced. Why should IT professionals have a model of the organization? After all, their information architectures seldom work. Furthermore, organizations are much more than information; in fact, they are characterized by many *organizational domains*: information, culture, people, business processes, learning, decision making, organizational structure, business strategy, power, and so on. Each of us intuitively knows this.

An organization model must answer a variety of questions, not merely those concerning IT: "Competition . . . is ultimately driven by ideas, not technology . . . ideas come to life in the form of business models and ultimately become the soul of the business, what Peter Drucker has called the 'theory of the business' . . . a successful business model must provide the right answers to a key set of questions" (Stahlman 1993).

1.2 ARCHITECTURE AND MODELING

Seemingly, every day a new management philosophy is introduced: business engineering, total quality management, organizational learning, culture change, knowledge management, and so on. Management is confronted with new ideas, but has no organizational framework in which they may be neatly placed and integrated. Furthermore, the failure of traditional IT frameworks has created the impression among senior managers that modeling, and to some extent architecture, does not deliver value to organizations.

But what do managers currently do? Don't they design, or "craft" strategy? How do they formulate new business processes and integrate them into their organization—their information systems, their culture, and so on?

Invariably, the artifacts of organizational design are little more than *lists* of things to be done, or *pictures* showing arrangements of things. These illustrations regularly appear in executive summaries, and eventually become "blueprints" by which plans are formulated, organizations designed, and work performed. And when the plans produce only marginal results, another study is initiated, there is another reorganization, and the process repeats itself.

For example, we have all seen "vision" statements, strategic goals, charts showing information flows, "maps" of business processes, culture change initiatives, new talk of organizational learning, and so on. Are these change efforts ever coordinated? Do they ever materialize into something concrete and integrated that actually improves performance?

Of course, if management is negligent and finds that it must institute change—for example, *reengineer* its business processes—some improvement will occur. But this argument negates itself. Successful reengineering efforts are testimonies to past management failures.

These artifacts of management are analogous to those of the early days of information technology—people have an idea of what they want, then implement something that supposedly corresponds to their intentions, adjust it when it fails, and hope for the best.

A Fresh Look at Organization Modeling

The missing ingredient in all this is a well-defined, yet practical framework by which the organization may be designed and changed. Such a framework is much more than the picturesque presentations that have become the trademark of modern management. And it is certainly *not* another IT enterprise model. But then, what constitutes such a framework? Can it be made convenient, suitable, and effective?

Successful organizations are driven by a consistent set of principles and constructs—organizational pieces, their interconnections, and their behaviors that collectively may be thought of as *organizational architecture*. Effective organizations are characterized by an ability to understand, interrelate, and leverage each of these pieces.

What are these organizational pieces? They are *organizational domains*: areas of interest to the organization that are distinct, yet interrelated. A list of domains includes strategy, information, organizational structure, business processes, products, people, knowledge, learning, technology, quality, culture—and much more. Furthermore, though information technology has become the primary change agent in modern organizations, no single domain (i.e., organizational piece) can work without each of the others. Their interconnections are as important as the pieces themselves, perhaps more so.

For example, a racecar may win or lose on the basis of its engine, but it's going nowhere without a driver and the lowly tire. Furthermore, a *particular*

driver and a *particular* set of tires may leverage the power of the engine more so than another driver or set of tires. And the same may be said of the pit crew. Motivation, commitment, mutual respect, and teamwork are as much the components of victory as is engine power.

So too an organization, no matter how IT-driven it may be, is going to be at a competitive disadvantage unless it knows how to associate and leverage each of its parts. This can be accomplished only with an organizational architecture—an architecture sufficiently rich in its modeling schema so that it may be used to define the intent of the planner, is implementable, and provides a mechanism for that implementation! And it must do so for the organization as a whole, for each of its pieces, and for their associations.

Applying Information Modeling

Managers require a new *language* to design organizations. The first element of a new language is a *vocabulary* to prescribe the behavior of organizational domains. The second ingredient is a *grammar* in which to model the associations among domains. Finally, managers require a new manner of *discourse* by which to implement their intentions.

This book presents a new language for organizational design. We draw on the discipline of information modeling to structure organizational pieces, and therefore, advance an organizational architecture and modeling approach called *organization modeling (OM).* A vocabulary for organizational planning and analysis, a grammar for design, a discourse for implementation—all in all, this is OM.

In addition, OM is strongly anchored in a philosophical foundation that supports the social sciences. It is therefore expected that in the future, not only managers and business executives, but also social science researchers will find OM to be a convenient approach that complements many of their modeling requirements.

You may ask, "Doesn't your new approach use the information modeling paradigm, and therefore, isn't this yet another IT business or enterprise model? What makes OM so special? Isn't it another IT model that you just argued against?" The answer is not so simple. We argue throughout this book that the answer to one technology approach is emphatically not another technology approach. The artifacts of one domain (e.g., IT) do not necessarily lend themselves to the specification of another (e.g., strategy)—not without a great deal of compromise.

For example, an article in a popular IT magazine actually suggests a new organizational structure built around object-oriented "classes" (Newman 1996). No doubt, this has a certain appeal to the IT professional. On the other hand, to a line manager this must sound preposterous, and only serves to underscore past IT failures at creating useful models. Information objects (i.e., classes) do not necessarily address the way value is added in an organization. They address neither the knowledge of people nor how they learn. Nor how strategy is formed. Nor how culture affects organizational behavior. And so on and so forth. And each of

these domains impacts the design of structure—IT being only one dimension of organizational design.

1.3 WHY OM?

Why are we using OM for developing organization models, and claiming that this is a revolutionary way of building such models? Are there not many business or organizational models already present? Are not these models already giving us enough information about organizations? In any case, why create another way of modeling? What is so special about OM that qualifies it as a revolutionary approach?

Such questions and many other ones will be raised by each of you. Obviously, as the innovators of OM, we must answer these questions.

The point is that we are not claiming any originality in developing a new discipline as such. What we *are* claiming is that we are trying to take an entirely fresh look at the whole game of organizational architecture. With this new approach to architecture, we advance new ways of designing cultures, strategies, structures, processes, and information systems that are supposedly suitable and useful to these organizations.

In doing this, we have to get to the bottom of the whole endeavor. We need to ask some very basic questions, including the famous one, "What is an organization in the first place?" The next question is "How do we go about building an organization that satisfies our requirements?" The question that arises further is "How do we implement these ideas that we formed in our minds while designing the organization in a manner that is convenient, suitable, realizable, and hence realistic in every sense of the word?"

To do this, we had to break new ground. The result of this quest is OM. OM provides a universal path that anyone—in particular, the manager-architect—can follow with reasonable assurance of reaching his or her goal. Such an assurance can come only if we can introduce precision into our thinking. If our thinking is nebulous, how can we make sure that we are on the right path?

Bringing precision requires specification. Precision may provide correct, legitimate, provable ways of implementation. Essentially, OM is a way of *channeling* and *crystallizing* our thoughts into something tangible. The word crystallization is very meaningful here. Before crystallization, everything is in a fluid state, in a state of flux. It is only during crystallization in nature that atoms (1) come together, (2) align themselves in an orderly fashion, (3) make the order repeat further throughout the entire structure, (4) make these atoms settle down in their respective positions gradually, first rather loosely in the form of a jelly, and (5) subsequently settle into well-organized fixed positions.

What is the result of all this? A beautiful, appealing crystalline structure. But it is not just beauty that is available here; the crystal structure also brings strength. The orderliness, the organization, the bonding, the repeatability—all lead to strength. That is something very desirable in organizations consisting of humans as well. Is it not?

1.4 THE EXPANSE OF OM

The width and breadth of OM include several foundational principles:

1. *Architecture-in-the-large and architecture-in-the-small.*
2. *Capturing the creative and informal aspects of organizations.*
3. *Harnessing tacit knowledge and learning.*
4. *Weaving the tapestry that contains all of the above.*

This book is adaptable as an advanced college text in both management and MIS curricula. It is also suitable as a reference book for managers and IT professionals. We discuss several concepts with which most students of management are familiar. This includes strategy models, the value chain, competence, tacit and explicit knowledge, etc. We give structure to the relationships between these concepts, thus giving added value and utility to each. Each concept has become popular because of its local application, whether in strategy, structure, etc. We show how these different relationships culminate in the development of a scalable architecture.

At a low level of analysis, we talk of the nitty-gritty. The *organization molecule* represents the building block of architecture. It may be used to formulate the internal constitution of a given domain, thus creating an architecture-in-the-small. This may include business process design, culture, knowledge, information, learning, and so on. Naturally, we may align these microconstituents for a proper placement into an architecture-in-the-large.

In the process of developing an architecture—whether in-the-large or in-the-small—we refer to several well-known management and organization concepts and disciplines. Some of these are very formal, such as data and information systems. Others are much more slippery, such as culture and learning. Managers have developed formal processes for the former, while either ignoring or merely separating the latter from the larger organization. In our approach, the two (formal and not so formal) are aligned, and thus a real-world architecture emerges.

One such example of a slippery concept is tacit knowledge. We provide a certain formalization of tacit knowledge. We illustrate the relationship between tacit knowledge and the culture model proposed by Edgar Schein. Furthermore, we propose a "formal" scheme that gives structure to tacit knowledge—the *knowledge contract* discussed in Chapter 14.

The most important and the most difficult aspect of organization modeling, though, is answering the question, "How do we capture the innate processes that occur inside the mind of a gifted and intelligent manager, which enable him or her to architect an organization that is bound to be successful in practice?" This requires an ability to somehow "express" the unformalizable, that is, to appropriately and explicitly reference what is tacit in the vision of the designer. This includes not only the individual components of the architecture, but also their interrelationships, and putting together all the pieces of the jigsaw puzzle.

1.5 ORGANIZATION OF THE BOOK

Part 1 introduces the structure and organization of OM. *Chapter 2* gives a brief review of organization theory (OT). OT is the discipline of structuring organizations, and provides us with the *materials* of OM. *Chapter 3* discusses several well-known concepts and issues associated with organizational design. This chapter includes contingency theory, Mintzberg's generic structure model, the employment relation, and so on. Although the content of Chapter 2 and Chapter 3 is a review to students of management, we intersperse value-added commentary.

Chapter 4 lays out the rationale and structure of OM. Three views of modeling are proposed for organizations: *the richness of modeling concepts, the level of granularity*, and *the refinement approach.* In OM, the refinement levels include a philosophy of organizations, the meta-framework in which to model the organization, the establishment of an organizational perspective, the creation and specification of architectural building blocks, the realization of the building blocks in which organizations find themselves, and finally, execution.

In *Chapter 5*, we develop a *layered model of the organization*. Layers of abstraction may be used to think about a variety of organizational characteristics. The layered model is used to represent an organization in an historical OT context. Examples of the Max Weber functional view of an organization, the size view of the Aston group from Great Britain, and so on, are each illustrated. Finally, a new way of thinking about organizations, and then crystallizing thoughts into orderly patterns, is presented. *Crystallization* involves the formulation and integration of thought patterns into concrete notions, making up a holistic representation of organizational reality. These pave the way for the development of a radically new building block of organizational design.

Chapter 6 introduces this new building block of OM: the *organization molecule.* A molecule represents the crystalline formations of generic modeling ideas as they pertain to an organization. Generic organization molecules are introduced for business processes, information, and organizational culture. The importance of imprecision to an organization's competitive distinctiveness (John Kay 1995) is also discussed. Examples of imprecise specifications known as *relational contracts* are reviewed. The importance of an organizational architecture composed of interrelated precise and imprecise contracts is advanced.

Chapter 7 introduces architecture and *alignment patterns.* Examples of alignment patterns and techniques include consistent, compatible, and dynamic alignment. The competitive advantage afforded an organization with both a hard (i.e., precise) and soft (i.e., imprecise) architecture is discussed. An example of cultural alignment described by John Kay is used to illustrate OM alignment patterns.

In *Chapter 8*, refinement and its relationship to managerial choice are discussed. Implementing OM through the *OM refinement model* is introduced. The OM stages of implementation are baseline, scoping and elaboration, specification, alignment, realization, and execution layers. The OM paradigm may be used with existing approaches to organizational design. Accordingly, we illustrate the correspondences between the OM refinement model and Tom Davenport's approach to business process reengineering (BPR), and Jay Galbraith's approach to designing an organization, respectively.

Chapter 9 discusses *patterns* as products of *crystallization* and *manifest representation.* A variety of organizational patterns, and their relationships to each other, are advanced. Organizational patterns and their formation are associated with molecules. A new high-level pattern, the *lattice,* is introduced. Lattices are patterns of molecules with specific organizational characteristics or properties. These properties include competitiveness, inventiveness, and adaptability. Finally, the importance of visualization in the design process is discussed.

Part 2 develops the notion of a 21st century organizational architecture. Its core principles include the relationships among culture, people, information, process, and learning.

Chapter 10 discusses culture and the culture model advanced by Edgar Schein. Also discussed are the idea of *directionality* and the importance of culture as its anchor.

Chapter 11 discusses the notion of *process formulation*. Process formulation is the development of all the artifacts of a business process: its characterization, transformation, specification, and design and implementation.

Chapter 12 discusses *data, knowledge,* and *information.* Information is characterized in terms of data (syntax) and knowledge (semantic) characteristics. Data and knowledge are each characterized. Knowledge is detailed in terms of several dimensions: *explicit* and *tacit* (Nonaka and Takeuchi 1995), *individual* and *social* (Spender 1993), *industry* and *organization* (Leonard-Barton 1995), and *distributed* and *common* (Sack and Thalissinidis 1998). Alignment contexts—*automating, informating,* and *knowledging*—are discussed. We update the *information continuum* introduced by Tom Davenport (1997), and discuss the various dimensions of *business rules: knowledge rules, relational rules, explicit rules,* and *data rules.*

Chapter 13 discusses *knowledge formulation.* Knowledge formulation includes a *knowledge world* framework, *layered knowledge models,* the *knowledge spiral* and its *conversion modes* (introduced by Nonaka and Takeuchi 1995), and *knowledge binding.* Also discussed are various *knowledge system models.* Finally, we illustrate the application of our knowledge system models by using them to characterize the ten strategy approaches described by Mintzberg, Ahlstrand, and Lampel (1998).

Chapter 14 discusses the emergence of a 21st century learning organization. The implications of *individual value* as well as *organizational value* in relation to learning are discussed. *Contract analogs* are introduced as constructs to explain the working of both the formal and informal aspects of organizations. There are two types of contract analogs: *complete* (i.e., *precise, relativized*), and *open* (i.e., *relational, knowledge*). The issues associated with both *system* and *organizational dynamicity* are discussed. An example of a *federated structure* for IS & IT is proposed as a mechanism to leverage the benefits of both centralized and decentralized decision making. *Knowledge management* is briefly reviewed, and a new system that implements an *integrated knowledge architecture* is presented. Finally, a framework for the *business designer of the 21st century* is advanced.

The *Appendix* contains an overview of information modeling. In the same way that organization and management literature provide us with the materials of OM, information modeling provides the glue to construct an architecture.