In recent years there has been a growing interest in the nature of knowledge, its structure, and its utilization. With the advent and eventual proliferation of computers and databases, knowledge has become a commodity embedded in our tools and in machines we use for everyday needs. We produce today more information (and knowledge) in one day than in all the years since the beginning of human civilization.

Imagine a situation where automobile manufacturers suddenly start producing worldwide more cars daily than in all of the hundred years since automobile production began. The existing infrastructure of roads and highways would certainly collapse—unless we are able to understand how such a flow of vehicles can be manipulated and tamed. Information and knowledge are generated today at an ever growing pace, in quantities and varieties that would have seemed inconceivable to our foreparents not more than two generations ago.

In the twilight years of the twentieth century, scholars and businesses have begun to address the issues of the generation, manipulation, and usages of knowledge. Soon there was a sense of urgency in the creation of knowledge management systems. These models and tools for dealing with the avalanche of knowledge in public and private organizations are still in their infancy—as are the theories and philosophies that underlie their principles and their functioning.

All these events are starting to congeal as critical components of a revised look at an age-old intellectual pursuit of so many scholars over the ages: what is knowledge, how is it structured, and how does it progress. Increasingly, knowledge is permeating every aspect of routine living in developed economies. Its sheer volume and its growing complexity and variability are challenging even the philistines to ponder such hitherto academic queries.
In the last decade of the twentieth century and the dawn of the twenty-first, extensive proliferation of information has made the world a very small place indeed. Progress in telecommunication technology and the Internet has penetrated even the most remote villages in the developing world. A child in any corner of the world has access today to the most extensive collection of human knowledge on any subject and in any depth—just by a click of a personal computer. This truly extraordinary phenomenon is one of the hallmarks of the new century.

As the world becomes smaller and more accessible, information and knowledge grow at an even faster pace. We are becoming a “knowledge economy” (Leonard, 1998; Mokyr, 2002; Stewart, 2001) and a “knowledge society” (Fuller, 2001; Leyderdorff, 2003). Knowledge is now universally considered the engine of economic growth and a strong factor in shaping societal relations. In summary, because of knowledge creation and proliferation, our world and that of our children is dramatically different from the world of our parents.

Ever since my studies in political sciences, business, and philosophy, followed by my relentless effort to understand the way technology behaves in organizations, I have been intrigued by the puzzle of human (and organizational) knowledge. It would, however, be presumptuous to consider the possibility that I can deliver in this book the answers to such age-old queries. I am cognizant and fully embrace the sentiment so aptly articulated by Stephen Jay Gould (2002a): “Instead of suggesting a principled and general solution, I shall ask whether I can specify an operational way…in a manner specific enough to win shared agreement and understanding among readers, but broad enough to avoid the doctrinal quarrels about membership and allegiance” (p. 7). I advance in this book my interpretation of how knowledge is structured and how it progresses. My model builds upon a critique of existing intellectual frameworks, but also offers a conciliatory approach that suggests a meaningful compromise proctored by the new model.

The model I espouse in this book has two distinct characteristics which differentiates it from the current literature. The first is the perspective of knowledge as a construct outside the data-information-knowledge-wisdom continuum. Although this distinction is not an original idea, it nevertheless emerges from my perspective of knowledge as the cumulation of sensorial inputs. The discussion of knowledge outside the data-information continuum is not merely a minor semantic distinction. Rather, it is a major conceptual differentiation between what constitutes knowledge and the notion of knowledge as simply some outcome from information. As we progress along this con-
tinuum, there also emerges the notion of wisdom. In this book, I consider wisdom to be a variant of knowledge, particularly knowledge-in-use. This definition distinguishes the knowledge that is useful and that serves some purpose for the knower.

The second distinct characteristic of knowledge in this book is the perspective of knowledge as the cumulation of sensorial inputs in the human mind. Instead of the evolutionary model in which knowledge develops from lower forms of information, in this book I view knowledge as the clustering of sensorial inputs, or sensations. These are cognitive processes, not the processing of information.

Such a model inevitably leads to conclusions about life, ethics, and the existence of an Almighty—all as a logical consequence from the view of knowledge as mental cumulation of sensorial inputs. Every experience or interaction of the mind with its external world is a different set of sensorial inputs with different modes of clustering. When these are added to the existing pool of knowledge previously formed with sensorial inputs, there is a cumulation effect that produces the arsenal of knowledge we possess. Memory and learning are the creation of patterns of sensorial inputs and their clustering in the mind.

In this book I reformulate the knowledge argument and critically discuss the concepts of qualia and consciousness. Knowledge therefore is a highly personalized event, so that the knower has great difficulties in sharing such cognitive outcomes in his mind. This leads to the conclusion that most of what we call “knowledge” is tacit, hence being to a large extent restricted to the knower. There is only a small amount of what we know that can be shared with others. Despite all our human effort as social beings with language, communication tools and processes, and organizational systems such as knowledge systems, we find it very difficult to freely exchange and to effectively diffuse the knowledge we possess.

The implications for organizations and for their KMSs (knowledge management systems) are far-reaching. KMSs have not been very successful. I discuss in this book the reasons for this phenomenon. In principle, the lack of success of organizational KMSs resides in the inherent inability of individuals in the organization to share what they know. It is not necessarily due to their selfishness or unwillingness to part with what they know, but mainly because they can only transfer and share a very small portion of their knowledge. This is, in part, why organizational incentive packages designed to encourage people to share their knowledge do not seem to be effective.
In the years since my study of the clustering of organizational indicators and the framing by technology managers of organizational phenomena (Geisler, 1979), the field of managerial cognition has grown in a vigorous pace. Fees and Zajac (2006), for example, studied the symbolic management perspective and the organization’s framing of strategic changes. They refer to framing processes and cognitive sensemaking as the means by which managers understand and interpret their environment and critical events within them. In Geisler (1979), I conclude that managers are able to frame complex interpretations of organizational phenomena with the use (or clustering) of a small number of different indicators of their organizations’ processes and structural dimensions. The emphasis was on the different indicators and how they are clustered in the managers’ minds.

Fees and Zajac (2006) took this a step further by extending the notion to specific strategic notions of how managers view the functioning of their organization. They arrived at two framing approaches—acquiescence and balancing—which they tested empirically.

The process that describes the creation of sensemaking and the framing of strategic approaches by managers is similar to that of knowledge generation. Managers are clustering different indicators of the patterns of growth of their organization, so as to arrive at a perspective that “makes sense” to them and adequately describes their changing environment.

What this means for organizations is the inevitable conclusion that knowledge is an individualized cognitive phenomenon and that there is a need to radically change the way we communicate and share knowledge in human organizations. In this book I argue for a “shift in the paradigm” of knowledge systems in organizations. Currently the focus of both research and practice is on improving the means and methods of transforming “tacit” into “explicit” knowledge, so that we can increase the amount of knowledge shared by organizational members. This approach is also derived from the writings of Japanese scholars such as Ikujiro Nonaka and his colleagues.

A different approach advocated in this book suggests the shifting of emphasis to improving the communication and exchange mechanisms. Whatever knowledge can be transferred (limited by the nature of knowledge as a cognitive phenomenon embedded in our minds), one has to improve the means by which such knowledge can and will be transferred to others. We should not be attempting to extract more tacit knowledge, but strengthen the transferability of that portion of knowledge that individuals are indeed capable of sharing and diffusing.
In this book I also advance the different model of knowledge: the “neuronal model.” This model is a culmination of introspection and the application of several disciplines with which I became familiar throughout my academic career.

This model further advances the notion that sensory elements are clustered by a knower, in successive iterations, leading to the creation of knowledge. The progress of knowledge in this model is defined in terms of the concept of continuous cumulation. The elements of knowledge are conjoined to form meaningful representation of nature and the knower’s reality, and are continuously added to the body of knowledge that exists in the knower’s possession and that can be shared by other knowers. This model has far-reaching implications for the design and manipulation of databases and knowledge systems, for ethics, for auditing, and for a variety of social and economic phenomena where knowledge is a key ingredient for functions of measurement and assessment.

Unencumbered by previous membership in the intellectual community that investigates epistemological and ontological problems of human thought, I emerge from a more practical field of organization scientists. This is both a plus and a shortcoming, neither of which is abundantly euphoric nor life-threatening. The more practical approach to the structure and progress of knowledge is illustrated (I hesitate to say “justified”) in the third part of this book. Examples are drawn from the design and utilization of databases and knowledge management systems, to the vetting of the model in its applications. This is not uniquely a “grounded theory” approach to the analysis (Glaser, 1968), nor is this simply a circuitous mode of claiming that the model is valid because it has practical applications, or that if there are practical applications, the model is valid. Rather, the empirical illustrations attest to the applicability of the model, not necessarily to its superiority over other models of the nature and the progress of knowledge.

This book is written with two audiences in mind. The first is the general public, any person with interest in knowledge and how knowledge management systems and their applications affect our lives. The ubiquitous presence of databases and knowledge systems makes this topic an interesting and exciting area for the modern person to explore. Even more, I believe that our daily encounters with knowledge systems trigger a desire to learn more about them.

The second audience includes academics, information and knowledge professionals, and people involved in the regulation and policymaking of information and knowledge systems. For this audience this book offers a novel
approach to the structure of knowledge and its progress. The third part of the book is an empirical showcase of how this structure and progress framework influence the design and manipulation of data and knowledge systems. Upon reading this book, professionals and academics will never approach data and knowledge systems with the same view. Data mining and explorations of knowledge dispersion and transfer will now be predicated on the possibility that the framework advanced in this book is a better explanation of how knowledge is structured and how it develops.

There is something to be said about a style of a book that attempts to advance the state of the art, yet appeals to a broad audience. The style of this book avoids the over-abundance of esoteric terms. Although I had to create some terminology that better explains my ideas, the overall tone of the text is to simply and concisely describe and explain even the more egregious concepts and ideas.

Although in this book I make extensive use of references from the relevant literatures, these sources are mainly employed to give a clearer picture of the prior work in this area. To the knowledgeable reader they serve as a list of readings to consult. To the lay person, the bibliography gives an initial review of what I consider to be the key studies in the area of knowledge, its measurement, and its systems.

A few words about the implications for organizations and the nascent field of knowledge management. The unique model of knowledge advanced in this book indeed has many applications in organizations. It explains not only why KMSs tend to largely be unsuccessful, but also how this situation can be rectified by shifting the paradigm or approach to organizational knowledge management. The model also allows for the development of organizational policies and incentives that recognize the nature of human knowledge and the limitation of its sharing and diffusion, and promote a better way in which people can exchange what they know and benefit from such interactions.

The text aspires to provide a balance between the discussion of theory and the application of the notions and constructs that the theory had advanced. I am a strong believer in Kurt Lewin’s pronouncement that there is nothing more practical than a good theory. If we are to truly understand the way in which knowledge is structured and the way in which it grows and progresses, we must be guided by a good theory, and this book offers such a theory.

Stephen Jay Gould (2002b) once argued that theories need both essences and histories. In this book I contemplated the development of theories that attempted to describe knowledge and explain its peculiarities. On their shoul-
ders, as Hawking (2002) has written, I devised an emerging theory (and its applications) that is the crux of this narrative.

References


