This glossary is included to facilitate ready reference to terms and concepts presented in the book that may be unfamiliar to the reader. Clearly, definitions and interpretations other than those included here exist and make sense as well, but the definitions and interpretations to follow are consistent with the presentation throughout the book. Almost every item includes a pointer to the chapter in which the associated terms and concepts are discussed.

**Abundance.** One of two dimensions used to characterize the knowledge hierarchy (see Ch. II). In any organization, data are more abundant than information is, which is in turn more abundant than knowledge is.

**Action.** The manifest accomplishment of some mental, social, or physical activity such as decision making, communication, or work (see Ch. I). The term *action* is used to differentiate the concept *knowledge* from *information*: knowledge enables direct action (e.g., correct decisions, appropriate behaviors, useful work), whereas information provides meaning and context for such action (e.g., decision criteria, behavior norms, work specifications).

**Actionability.** One of two dimensions used to characterize the Knowledge Hierarchy (see Ch. II). In any organization, knowledge is more actionable than information is, which is in turn more actionable than data are.
**Apprentice.** A person who works with a skilled master or craftsman to learn a skill or craft. Apprenticeship represents a technique for experts to share tacit knowledge (see Ch. I).

**Appropriation.** A term connoting one’s ability to assert ownership over some asset, generally with the intent to extract *economic rent* (e.g., monetary payment) from it. The term *appropriation* is used to differentiate tacit knowledge from its explicit counterpart in terms of greater competitive advantage (see Ch. I).

**Articulable knowledge.** Knowledge that can be described through words, diagrams, formulae, computer programs, and like means. The term *articulable* is used to differentiate explicit knowledge from its tacit counterpart (see Ch. II).

**Articulation.** The action of describing knowledge through words, diagrams, formulae, computer programs, and like means. Tacit knowledge resists articulation and transfer (see Ch. I).

**Artificial intelligence.** This field of computer science focuses on developing computational devices (e.g., expert systems and software agents) that emulate the behaviors of people who are considered to be intelligent. Unlike most information technologies, many artificial intelligence applications address knowledge — as opposed to information — directly and are performatively in nature (see Ch. IV).

**Backcasting.** A modification of forecasting techniques through the process of “predicting,” *ex-post*, known organizational outcomes using only information that was available at the beginning of a project. This technique is used to validate computational models (see Ch. VI).

**Barrier to market entry.** An impediment that makes it difficult for some rival firm to compete in a particular market. Barriers to market entry can be financial (e.g., high capital costs), positional (e.g., large market share and brand loyalty), geographical (e.g., the best location), knowledge-based (e.g., inimitable knowledge), and based on other advantages (see Ch. I).
**Business Process Re-engineering.** A philosophy and set of tools and methods conceived originally as an approach for radical change to effect dramatic performance improvements in organizations. This organizational phenomenon in the 1990s provided a broad-based impetus and set of techniques to enable organizations to perform better with fewer resources (see Ch. I). Re-engineering research has addressed several important questions pertaining to managing change (see Ch. VI). As with most knowledge management projects today, the abundance of re-engineering projects focused on information technology.

**Case-based reasoning.** An artificial intelligence technique that uses aspects of stored case descriptions to guide computational inference pertaining to problem solving associated with similar cases. Organizational applications such as technology help desks demonstrate benefits of this approach (see Ch. IV).

**Chat.** The common name for the *Internet relay chat protocol* that enables users to exchange near-synchronous, near-duplex, textual messages between computers. This information technology application is used for distributed, synchronous, text-based communications, often in the place of telephone or radio conversations. Chat differs from e-mail in that it supports synchronous communication, whereas e-mail messages are asynchronous (see Chs. II and IV).

**Competency trap.** This term *competency trap* (Levitt & March, 1988) is used to describe a situation in which an organization develops considerable competency in some area, only to find itself unable to develop one or more alternate competencies when necessitated by either management strategy or environmental shifts (see Ch. I). Competency traps can develop through unbalanced focus on exploitation of extant knowledge over exploration to develop new knowledge (see Ch. V).

**Competitive advantage.** This concept is discussed generally in economic terms such as earning superior rents, gaining larger market share, raising barriers to market entry, locking out competitors, and locking in customers (see Ch. I). It pertains more generally to the ability of one organization to outperform its competitors.
**Competitive disadvantage.** This is the opposite of competitive advantage. It pertains generally to the ability of an organization’s competitors to outperform it. Where knowledge fails to flow well, even to enable ordinary workflows, the organization may experience competitive disadvantage, as it fails to perform even its routine work effectively (see Ch. I).

**Competitive potential.** This refers to the potential for competitive advantage. By the term *potential*, we imply that a firm has the capability to attain competitive advantage but may not have done so yet through manifest action (see Ch. I).

**Competitive resource.** In a resource-based view, an organization competes on the basis of the unique set of resources it possesses and puts to use. Economic inputs such as land, labor, and capital represent traditional resources employed in this view. Knowledge represents more than just another resource along these lines because it can enable sustainable competitive advantage (see Ch. I).

**Computational modeling.** This information technology application represents an extension of simulation (see Ch. IV). Computational models are used extensively in the physical sciences (e.g., to represent the dynamics of phenomena such as fluid flows, heat transfers, and resilience of structures) and progressively more often in the social sciences (e.g., to represent the dynamics of money flows, economic transfers, and communication structures). Models from both sciences provide a basis for designing physical artifacts (e.g., airplanes, bridges, computers) and for making decisions about social systems (e.g., finance, trade, broadcasting) by representing such artifacts and systems via models and by simulating their dynamic behaviors under various conditions (see Ch. VI).

**Context.** Context refers to the situation, environment, and perspective of actions such as cognition, conversation, and work. Context can make data intelligible and enable them to convey meaning as information (see Ch. II). The term *context* is used along with *meaning* to operationalize the concept *information*.
Core competencies. The capabilities that can enable competitive advantage for an individual, group, or organization. Many organizations shed peripheral capabilities to focus their attention on the core set that is most relevant strategically (see Ch. V).

Core rigidities. The duality associated with core competencies that restrict the range of activities that can be performed well by an organization (see Ch. V).

Critical path. The sequence of tasks, activities, and/or events in a project that determine the shortest possible schedule for completion. The critical path concept is used extensively in project management for planning and analysis. Because knowledge is required for the performance of work, knowledge flows can be viewed clearly as lying on the critical paths of the workflows they enable (see Ch. I).

Data. Data are operationalized best as interpreted signals that can reduce uncertainty or equivocality. Relationships and distinctions between data, information, and knowledge are important (see Ch. II).

Database. A class of information technology applications for the organized storage and retrieval of data. Databases can be massive and sophisticated. As conveyed by their name, databases address data, not information or knowledge (see Chs. II and IV).

Data mining. The use of statistical and inferential pattern-matching techniques to identify regularities in databases that are imperceptible to most people. The discovery of new patterns and regularities in data represents a form of knowledge creation (see Chs. II and IV).

Data warehouse. A very large, generally decision-support database that is used to collect, organize, and retrieve data from multiple, generally operational databases. Data warehouses are often used in conjunction with data mining (see Ch. IV).
**Database query.** The use of interactive techniques for a user to extract desired subsets and summaries of data from a database. Database queries are often used to answer factual or statistical questions.

**Declarative knowledge.** The class of knowledge that is expressed as facts or assertions. The term *declarative knowledge* is often used in contrast with *procedural knowledge* (see Ch. II).

**Diagnose.** The deductive sequence of tasks associated with identifying a problem or pathology. The term *diagnose* is often used in a medical context of identifying diseases. This term also makes sense in the context of identifying problems or pathologies suffered by an organization. *Knowledge clumping* represents one such pathology addressed in particular in this book (see Ch. I).

**Discussion board.** An information technology application that enables multiple, simultaneous, asynchronous textual conversations between geographically distributed participants. Generally, each unique conversation is labeled with a title and separated from other conversations as distinct *threads*. This groupware application offers infrastructural support for knowledge work and enhances the environment in which knowledge artifacts are created and managed (see Ch. II).

**Discussion thread.** A unique, segmented, and labeled conversational topic associated generally with discussion boards, network news groups, and e-mail lists (see Ch. II).

**Document repository.** An information technology application for the organized storage and retrieval of documents. A document repository is equipped generally with some kind of search engine that uses keyword matching and like techniques to locate and retrieve documents of potential interest to users. The document repository is analogous to the database in terms of function and use. The document repository addresses documents, whereas the database addresses data (see Chs. II and IV).

**Doing.** A form of knowing focused on accomplishing work activities (see Ch. I). The term *doing* is used often for contrast with *learning* (see Ch. V).
**E-mail.** Electronic mail is an information technology application that enables the asynchronous exchange of textual messages across computer networks. The e-mail application complements its chat counterpart, the latter of which enables synchronous, networked communication (see Chs. II and IV).

**Education.** A formal approach to knowledge flow in which students enroll in organized courses offered by institutions such as universities, colleges, and vocational schools. Generally, an instructor leads the course, which consists of prearranged readings, assignments, lectures, laboratory experiments, discussions, and other learning activities. The term *education* is often used in the same context as *training* (see Ch. I) and for contrast with other knowledge-flow processes such as *on-the-job training* (OJT), *trial and error*, *direct experience*, and others that connote the informal accumulation of experience-based knowledge (see Ch. III).

**Ephemeral competitive advantage.** Competitive advantage that can be obtained but not sustained over time. The term *ephemeral competitive advantage* is often used for contrast with *sustainable competitive advantage* (see Ch. I).

**Ephemeral knowledge.** Knowledge that can be created or acquired but not retained or preserved over time (see Ch. I).

**Equivocality.** A state of ignorance pertaining to context, in which the causes of observable or putative effects or results cannot be identified, or in which decision makers lack sufficient knowledge of their situation to even know which questions to ask. The terms *equivocality* and *uncertainty* are often used in the context of data (see Ch. II).

**Experience.** The accumulation of knowledge associated with direct interaction with some object, process, or system in the world (see Ch. I). The term *experience* is often used in connection with the performance of work activities. The performance of people and organizations improves generally as a result of experience and can often be measured using learning curves (see Ch. VI).
**Experience-based knowledge.** Knowledge created and accumulated through experience (see Ch. 1). Such knowledge is generally tacit and slow to accumulate (see Ch. III).

**Expert.** A person recognized as possessing qualitatively higher levels of skill and experience in some domain than most people possess. The term expert is often used to describe a person who has accumulated very large stocks of knowledge and for contrast with novice (see Chs. I, IV, and V).

**Expert system.** An information technology application from the field of artificial intelligence that seeks to emulate the performance of human experts. Expert system applications address knowledge directly and are performative in nature. This provides a contrast with the supportive nature of most information technologies (see Ch. IV).

**Explicit knowledge.** Knowledge that has been articulated through words, diagrams, formulae, computer programs, and like means. The term explicit knowledge is used widely for contrast with tacit knowledge, which cannot be or has not been articulated, and with implicit knowledge, which can be but has not been articulated (see Ch. II).

**Explicitness.** The relative ability to articulate knowledge. Explicitness describes the nature of knowledge along a dimensional construct with tacit and explicit endpoints. It represents one of the four dimensions used in this book to classify and visualize knowledge flows (see Ch. III).

**Exploitation.** The application of extant knowledge for organizational performance and pursuit of competitive advantage (see Ch. I). The term exploitation is often used for contrast with exploration (March, 1991). Exploitation involves principally the form of knowing called doing and the application or refinement of existing knowledge, whereas exploration involves principally the form of knowing called learning and the creation or acquisition of new knowledge (see Ch. V).

**Exploration.** The search for new knowledge for organizational performance and pursuit of competitive advantage (see Ch. I). The term exploration is often
used for contrast with *exploitation* (March, 1991). Exploration involves principally the form of knowing called *learning* and the creation or acquisition of new knowledge, whereas exploitation involves principally the form of knowing called *doing* and the application or refinement of existing knowledge (see Ch. V).

**Externalization.** One of four knowledge-flow processes associated with the Spiral Model (Nonaka, 1994) of knowledge flows. The term *externalization* refers generally to knowledge formalization from tacit to explicit form (see Ch. III).

**Flow principles.** Systematic and general principles pertaining to fluid movements such as exhibited by water, air, heat, and electricity. Flow principles are used to describe, explain, and predict the dynamics of such fluids. Flow principles can be used also to describe, explain, and predict the dynamics of knowledge (see Ch. III).

**Gedanken experiment.** *Gedanken* means “thought.” Gedanken experiments refer to mental simulations (see Chs. I, II, and IV).

**General knowledge.** Knowledge that pertains more to high-level patterns and relationships than to low-level details. The term *general knowledge* is often used for contrast with *specialist knowledge*. To some extent, general and specialist knowledge can be substituted for one another (see Ch. VI).

**Groupware.** A class of information technology applications that offer infrastructural support for knowledge work and enhance the environment in which knowledge artifacts are created and managed. Common organizational applications include e-mail, chat, discussion boards, and like technologies (see Ch. IV).

**Ignorance.** The lack of knowledge in some domain or area. The adjective *ignorant* is often used for contrast both with both *knowledgeable* and *stupid*. The former contrast connotes that the ignorant person lacks knowledge (see Ch. I). The latter contrast connotes that the ignorant person is capable of learning to overcome ignorance (see Ch. V). Groups and organizations can be ignorant, knowledgeable, or stupid.
Imitable. Capable of imitation. Where knowledge that enables some kind of competitive advantage is imitable, the corresponding advantage is likely to be ephemeral. Competitors will try to imitate the organizational processes, technologies, products, and services that provide for competitive advantage. Organizational capabilities predicated on explicit knowledge are more imitable generally than those predicated on tacit knowledge are (see Ch. I).

Implicit knowledge. Knowledge that is articulable but has not been articulated yet through words, diagrams, formulae, computer programs, and like means. The term implicit knowledge is used widely for contrast with tacit knowledge, which cannot be or has not been articulated, and with explicit knowledge, which can be and has been articulated (see Ch. II).

Information. Information is operationalized best as providing meaning and context for action. Relationships and distinctions between data, information, and knowledge are important (see Ch. II).

Inimitable. Incapable of imitation. Where knowledge that enables some kind of competitive advantage is inimitable, the corresponding advantage is likely to be sustainable. Competitors may try but will fail to imitate the organizational processes, technologies, products, and services that provide for competitive advantage. Organizational capabilities predicated on tacit knowledge are more inimitable generally than those predicated on explicit knowledge are (see Ch. I).

Instruction. This knowledge-flow process is associated with formal classroom education or training (see Ch. I). It focuses more on the knowing activity learning than on doing and is used often for contrast with experience-oriented knowledge-flow processes such as on-the-job training (OJT), trial and error, and the like (see Ch. V).

Intelligent tutoring. An information technology application from artificial intelligence that uses models of students to facilitate and tailor pedagogical decisions and actions such as lesson plans, tests, and reinforcement activities (see Ch. IV).
Internalization. One of four knowledge-flow processes associated with the Spiral Model (Nonaka, 1994) of knowledge flows. The term internalization refers generally to knowledge refinement from explicit to tacit form (see Ch. III).

Intranet. An information technology application comprised of computer networks and services that are based on Internet standards and protocols but restricted to use by people within an organization. Most such applications are Web-based (see Ch. IV).

Knower. The entity associated with knowing, either learning or doing (see Chs. II and V).

Knowing. Knowing involves knowledge in action. Learning and doing represent two forms of knowing (see Ch. V).

Knowing-doing gap. A knowing-doing gap (Pfeffer & Sutton, 1999) manifests itself in part when organizations “know better” than to do what they do and in part when organizations “know how” to do something they do not do (see Ch. V).

Knowledge. Knowledge is operationalized best as enabling direct action. Relationships and distinctions between data, information, and knowledge are important (see Ch. II).

Knowledge acquisition. Gaining new knowledge through learning. Knowledge acquisition represents a form of knowledge creation. The knowledge acquired need not be “new” to the entire world (e.g., knowledge developed through scientific discovery). Rather, such knowledge needs only to be new in the context of its coordinates (e.g., to an individual or organization, at a particular point in space or time; see Ch. V).

Knowledge application. Using existing knowledge through doing. Knowledge application involves putting knowledge into action. Knowledge application represents the fifth stage of the knowledge life cycle (see Ch. III).
**Knowledge audit.** The Knowledge Audit (Liebowitz et al., 2000) is a diagnostic activity focused on identifying organizational problems with potential to be addressed via knowledge management (see Ch. VI).

**Knowledge-based theory of the firm.** An extension of the resource-based view that privileges the power of knowledge for competitive advantage (see Ch. I).

**Knowledge capture.** Gaining new knowledge through learning. Knowledge capture represents a form of knowledge creation. The knowledge captured need not be “new” to the entire world (e.g., knowledge developed through scientific discovery). Rather, such knowledge needs only to be new in the context of its coordinates (e.g., to an individual or organization, at a particular point in space or time; see Ch. V).

**Knowledge chunks.** Discrete units of knowledge acquired through learning. A chunk can be a low-level unit such as a fact, medium-level unit such as a procedure, or high-level unit such as a pattern. The psychological term chunking refers to the cognitive process associated with memory and recall. The accumulation of many knowledge chunks is associated with expertise (see Ch. I) and expert systems development (see Ch. IV).

**Knowledge clump.** Knowledge that collects at some isolated coordinate (e.g., in an individual or organization, at a particular point in space or time; see Ch. III). Knowledge clumps are symptoms of flow pathologies in the organization.

**Knowledge consumer.** A person or organization on the receiving end of knowledge flows and that is learning new knowledge. The term knowledge consumer is often used synonymously with knowledge receiver and for contrast with knowledge producer/source (see Ch. II).

**Knowledge creation.** Gaining new knowledge through learning. Knowledge creation represents the first stage of the knowledge life cycle (see Ch. III). The knowledge created need not be “new” to the entire world (e.g., knowledge developed through scientific discovery). Rather, such knowledge needs only to
be new in the context of its coordinates (e.g., to an individual or organization, at a particular point in space or time; see Ch. V).

**Knowledge differential.** The difference in levels of knowledge stocks between two or more different individuals or organizations. Knowledge differential can provide a basis for competitive advantage (see Ch. I).

**Knowledge directionality.** A vector representation of dynamic knowledge, in which the corresponding flow has a distinguishable source and receiver (see Ch. II).

**Knowledge dissemination.** Sharing knowledge broadly. Knowledge dissemination represents a form of knowledge sharing, associated generally with explicit knowledge and broad organizational reach (see Ch. III).

**Knowledge dynamics.** The study of how knowledge moves with respect to time. Phenomenological research methods are most prevalent in this study at present.

**Knowledge engineer.** A technological intermediary responsible for the development of expert systems (see Ch. IV).

**Knowledge-flow process.** The sequence of organizational activities responsible for producing and propagating knowledge flows (see Ch. III).

**Knowledge-flow theory.** The canon of principles and techniques from knowledge dynamics pertaining to the phenomenology of knowledge flows.

**Knowledge-flow visualization.** The graphical representation of knowledge flows that uses a multidimensional vector space to delineate dynamic movements of knowledge (see Ch. III). The four dimensions *explicitness, reach, life cycle, and flow time* are used in this book for visualization of knowledge flows.
Knowledge flow. A dynamic movement of knowledge between coordinates (e.g., between individuals or organizations, or points in space or time; see Ch. III).

Knowledge flow time. The amount of time required for knowledge to flow between coordinates (e.g., individuals or organizations, or points in space or time). Knowledge flow time represents one of the four dimensions used in this book to classify and visualize knowledge flows (see Ch. III).

Knowledge flow vector. A graphical representation of knowledge flows in which arrows are used to depict dynamic motion (see Ch. III).

Knowledge formalization. Making tacit knowledge take explicit form. Knowledge formalization represents the third stage of the knowledge life cycle (see Ch. III).

Knowledge hierarchy. The knowledge hierarchy (Nissen, 2002a) provides a conceptualization of interrelations between knowledge, information, and data (see Ch. II).

Knowledge hoarding. The practice of not sharing knowledge (see Ch. I).

Knowledge inertia. The tendency of knowledge at rest to remain at rest. Knowledge that has clumped will remain clumped unless some kind of managerial intervention is taken (see Ch. III).

Knowledge inventory. A construct to measure the level of knowledge stock in a person or organization. An organization’s knowledge inventory both enables and inhibits what actions it can take (see Chs. I and V). The term knowledge inventory is often used synonymously with knowledge level.

Knowledge level. A construct to measure the knowledge inventory possessed by a person or organization (see Chs. I and V). The term knowledge level is often used synonymously often with knowledge inventory.
Knowledge life cycle. A dimensional construct to characterize the kind of activity associated with knowledge flows. Knowledge life cycle represents one of the four dimensions used in this book to classify and visualize knowledge flows (see Ch. III).

Knowledge management. The practice of leveraging knowledge for competitive advantage. Most knowledge management programs to date have focused on technology (see Ch. IV).

Knowledge management system. A suite of information technology applications and organizational routines employed for knowledge management. Most knowledge management systems employed to date have focused on technology (see Ch. IV).

Knowledge management tools. A set of information technology applications employed for knowledge management (see Ch. IV).

Knowledge power. The capability of harnessing dynamic knowledge for competitive advantage (see Ch. I).

Knowledge producer. A person or organization on the sending end of knowledge flows and that is sharing existing knowledge. The term knowledge producer is often used synonymously with knowledge source and for contrast with knowledge consumer/receiver (see Ch. II).

Knowledge receiver. A person or organization on the receiving end of knowledge flows and that is learning new knowledge. The term knowledge receiver is often used synonymously with knowledge consumer and for contrast with knowledge producer/source (see Ch. II).

Knowledge refinement. Learning over time from experience. Knowledge refinement represents the sixth stage of the knowledge life cycle. It connects knowledge application with knowledge creation to complete a cycle of knowledge flows (see Ch. III).
Knowledge sharing. Inducing knowledge to flow between different people or organizations. Knowledge sharing represents the fourth stage of the knowledge life cycle (see Ch. III).

Knowledge stocks. A concept to characterize the level of knowledge accumulated by a person or organization. Knowledge inventory and knowledge level represent two measures intended to operationalize the concept knowledge stocks. Knowledge flows and knowledge stocks interrelate tightly and dynamically (see Ch. V).

Knowledge source. A person or organization on the sending end of knowledge flows and that is sharing existing knowledge. The term knowledge source is often used synonymously with knowledge producer and for contrast with knowledge consumer/receiver (see Ch. II).

Knowledge technology. Technology used for knowledge management. Information technologies are employed most widely at present for knowledge management (see Ch. IV).

Knowledge transfer. Sharing knowledge locally. Knowledge transfer represents a form of knowledge sharing, associated generally with tacit knowledge and broad organizational reach (see Ch. III).

Knowledge uniqueness. The strong distinction between the concepts knowledge and information/data (see Ch. II).

Knowledge value analysis. Knowledge Value Analysis (Housel & Bell, 2001) employs principles such as information entropy in attempt to measure the return on investments in acquiring and sharing knowledge (see Ch. VI).

Learning. Learning refers to knowledge in motion. It is used most often to characterize the creation or acquisition of new knowledge. The term learning is often used for contrast with doing (see Ch. V).
**Learning curves.** An empirical technique that blends theory with practice to measure knowledge flows (see Ch. VI). Knowledge-based performance at the individual, group, and organizational levels improves at a measurable and predictable rate through task repetition and refinement.

**Learning rate.** The speed at which learning is accomplished. Learning rate is inversely proportional to knowledge flow time (see Ch. I).

**Local knowledge.** Knowledge of proximal conditions. Much tacit knowledge is local in nature, meaning it can be difficult to share broadly (see Ch. III).

**Locking in customers.** Raising switching costs that prohibit customers from pursuing products or services from rival competitors (see Ch. I).

**Locking out competitors.** Raising barriers to entry that prohibit new competitors from challenging an organization (see Ch. I).

**Management interventions.** Actions taken by leaders and managers to change aspects of an organization that are seen as problematic or pathological (see Ch. I).

**Market share.** The fraction of a market segment that is controlled by a particular competitor (see Ch. I).

**Meaning.** The significance of information. Meaning implies that a message has caused some cognitive change in the receiver’s understanding. This term is used along with context to operationalize the concept information (see Ch. II).

**Mentoring.** A knowledge-flow process in which an experienced or otherwise-knowledgeable person helps a less-experienced or -knowledgeable person to learn in a work setting. Mentoring is a part of apprenticeship and contrasts with both the knowledge-flow processes on-the-job training/trial and error and formal education/training (see Ch. III).
**Metadata.** Data about data in a database. Metadata are used to describe characteristics of the data that are organized and stored within a database. Examples include the names of fields, types of values various data can take on, and relationships between different database tables (see Ch. II).

**Multimedia.** An information technology application that enables textual, graphical, audio, and other modes of data to flow across a network and to be presented simultaneously, in an integrated manner (see Ch. II).

**Novice.** A person recognized as possessing qualitatively lower levels of skill and experience in some domain than most people possess. The term *novice* is often used to describe a person who has accumulated very small stocks of knowledge and for contrast with *expert* (see Chs. I, IV, and V).

**Observation.** Physically watching some task, activity, or process performed, often with the intent of learning how to perform such task, activity, or process (see Ch. II).

**On-the-job training.** Direct experience with some work task, activity or process, generally with the implication that some kind of experience-based learning is taking place. *On-the-job training* (OJT) is used widely as a euphemism for *trial and error*, a relatively slow and error-prone but pervasive knowledge-flow process employed by organizations (see Chs. I and III).

**Organization.** A collective of people who coordinate their actions for some common purpose.

**Organizational change.** A program of planned alteration of the structure, processes, technologies, or other aspects of an organization (see Ch. VI).

**Organizational learning.** Learning at the organizational level of reach. Organizational learning is a form of knowing that relates most closely with knowledge flows and is oriented principally toward exploration. In contrast, organizational memory is a form of knowing that relates more closely with knowledge stocks or inventories and is oriented principally toward exploitation (see Ch. V).
**Organizational memory.** Memory and retrieval at the organizational level of reach. Organizational memory is a form of knowing that relates most closely with knowledge stocks or inventories and is oriented principally toward exploitation. In contrast, organizational learning is a form of knowing that relates more closely with knowledge flows and is oriented principally toward exploration (see Ch. V).

**Organizational performance.** How closely the results of an organization’s actions fit its goals. Performance of one organization can be absolute in terms of its internal goals or can be relative in terms of competitors’ performance (see Ch. I).

**Organizational reach.** A dimensional construct to characterize the level of social aggregation associated with knowledge flows. Organizational reach represents one of the four dimensions used in this book to classify and visualize knowledge flows (see Ch. III).

**Organizational routines.** Systems, procedures, habits, and patterns of activity in organizations that produce outputs and represent knowledge application at the organizational level of reach (see Ch. III).

**Path-dependent.** The longitudinal nature of organizational experience that results from making choices. Once one metaphorical path has been chosen, one or more alternate paths cannot be taken at the same time. An organization develops a set of capabilities based on activities it has experienced over time, but it also fails to develop alternate sets of capabilities based on activities it has not experienced over time. Path-dependency relates to both core competencies and core rigidities in terms of organizational learning (see Ch. V).

**Pathology.** A serious problem or illness. Knowledge clumping represents a common organizational pathology (see Ch. I).

**Performative applications.** A class of information technology applications that focus directly on knowledge and are able to perform work in lieu of people. The term performative is used often for contrast with supportive applications (see Ch. I).
**Precedence relations.** A necessary sequential ordering. Various knowledge flows are interrelated tightly through precedence relations; that is, some chunks of knowledge must complete their flows before others can begin effectively. Workflows are related by precedence as well (see Ch. III), and many knowledge flows are precedent to the workflows they enable (see Ch. I).

**Procedural knowledge.** The class of knowledge that is expressed as processes or procedures. The term *procedural knowledge* is often used in contrast with *declarative knowledge* (see Ch. II).

**Qualitative reasoning.** A class of information technology applications from artificial intelligence that seek to represent and support inference pertaining to common sense knowledge. This represents a contrast with expert systems, which seek to represent and support inference pertaining to expert knowledge (see Ch. IV).

**Redesign.** Planned organizational change, generally on a relatively large scale. The term *redesign* is often used to describe the key analytical activity associated with business process re-engineering (see Ch. VI).

**Research.** A knowledge-flow process focused on systematic discovery of new knowledge. Research focuses on exploration through learning new knowledge but also involves exploitation through application of existing knowledge (see Ch. III).

**Resource-based view.** In a resource-based view, an organization competes on the basis of the unique set of resources it possesses and puts to use. Economic inputs such as *land*, *labor*, and *capital* represent traditional resources employed in this view. *Knowledge* represents more than just another resource along these lines because it can enable sustainable competitive advantage (see Ch. I).

**Search engine.** An information technology application that uses keyword matching and like techniques to locate and retrieve documents of potential interest to a user. Search engines commonly accompany document reposito-
ileges, intranets, and Web portals, and they are invaluable for finding information on the Internet (see Ch. II).

**Semantic.** Having to do with meaning. Knowledge is required to establish a semantic structure to represent information (see Ch. II). The term *semantic* is used frequently to distinguish information technologies that focus on information from those that focus on data (see Ch. IV).

**Semantic Web.** A class of information technology applications, many involving artificial intelligence, that combine and integrate diverse techniques to enable computers to accomplish autonomously many information work tasks that can be accomplished at present only by people (see Ch. IV).

**Shell tools.** A class of information technology applications involving artificial intelligence that are used to develop expert systems (see Ch. IV).

**Shopping bots.** A class of information technology applications, many involving artificial intelligence, that are used to automate several aspects of information work associated with shopping (see Ch. IV).

**Signals.** Physical patterns that may be interpreted to constitute data. All flows of knowledge, information, and data reduce ultimately to signals in the physical realm (see Ch. II).

**Single-loop learning.** Single-loop learning (Argyris & Schon, 1978) represents organizational learning that focuses on improving performance with respect to a static goal; that is, an organization can learn to do the wrong thing very well and not realize that its competency is suited well to the environment no longer. The term *single-loop learning* is often used synonymously with *competency traps* (Levitt & March, 1988) and for contrast with *double-loop learning*, the latter of which pertains to learning how and when to adjust organizational goals (see Ch. I).

**Situated knowledge.** Knowledge that is proximal to the knower and context. Situated knowledge implies that one must be at a particular space-time
coordinate to learn. Such knowledge tends to be tacit and local, making it difficult to share broadly (see Ch. I).

Socialization. One of four knowledge-flow processes associated with the Spiral Model (Nonaka, 1994) of knowledge flows. The term socialization refers generally to knowledge sharing in tacit form (see Ch. III).

Software agents. A class of information technology applications, many involving artificial intelligence, which are used to automate several aspects of information work. Shopping bots represent a kind of software agent. Software agents play a prominent role in the Semantic Web (see Ch. IV).

Specialized expertise. Knowledge that pertains more to low-level details than to high-level patterns and relationships. The term specialist knowledge is often used for contrast with general knowledge. To some extent, general and specialist knowledge can be substituted for one another (see Ch. VI).

Standard operating procedure. A formal, generally written routine for performing a set of work tasks in the organizational context. Standard operating procedures reflect explicit knowledge used to support organizational routines (see Ch. I).

Sticky knowledge. Sticky knowledge (von Hippel, 1994) represents tacit experience that is difficult to transfer across organizational units (see Ch. I).

Supportive applications. A class of information technology applications that focus indirectly on knowledge to support people who perform work tasks. The term supportive is often used for contrast with performative applications (see Ch. I).

Sustainable competitive advantage. Competitive advantage that can be obtained and sustained over time. The term sustainable competitive advantage is often used to contrast with ephemeral competitive advantage (see Ch. I).
**Tacit knowledge.** Knowledge that cannot be or has not been articulated through words, diagrams, formulae, computer programs, and like means. The term *tacit knowledge* is used widely for contrast with *explicit knowledge*, which has been articulated in explicit form, and with *implicit knowledge*, which can be but has not been articulated (see Ch. II).

**Tactic.** A set of actions based upon knowledge. The term *tactic* is often used when describing competitive military combat actions (see Ch. I).

**Taxonomy.** An organized hierarchy of concepts. Taxonomies are used broadly to classify concepts such as different kinds of life, different kinds of rocks, and like tangible concepts. Taxonomies are used also to classify different kinds of knowledge, information, and data (see Ch. II).

**Teaching.** This knowledge-flow process is associated with formal classroom education or training (see Ch. I). It focuses more on the knowing activity *learning* than on *doing* and is often used for contrast with experience-oriented knowledge-flow processes such as *on-the-job training* (*OJT*), *trial and error*, and the like (see Ch. V).

**Tradeoff.** The requirement for a decision maker to give up some of one thing of value in order to obtain more of another valued item. Tradeoffs manifest themselves broadly in decision making when resources are constrained (see Ch. III).

**Training.** A formal approach to knowledge flow in which students enroll in organized courses offered by human resource departments and like units within organizations. Generally, an instructor leads the course, which consists of prearranged readings, assignments, lectures, laboratory experiments, discussions, and other learning activities. The term *training* is often used in the same context as *education* (see Ch. I) and for contrast with other knowledge-flow processes such as *on-the-job training* (*OJT*), *trial and error*, *direct experience*, and others that connote the informal accumulation of experience-based knowledge (see Ch. III).
**Trial and error.** Direct experience with some work task, activity, or process, generally with the implication that some kind of experience-based learning is taking place. The term *trial and error* is used sparingly as a substitute for *on-the-job training* (OJT), a relatively slow and error-prone but pervasive knowledge-flow process employed by organizations (see Chs. I and III).

**Uncertainty.** A state of ignorance pertaining to fact, in which the values of particular states or variables are unknown, but in which decision makers have sufficient knowledge of their situation to know which questions to ask. The terms *uncertainty* and *equivocality* are used often in the context of data (see Ch. II).

**Video teleconferencing.** An information technology application enabling synchronous, remote, multimedia communications, generally through multiplexed audio and visual channels (see Ch. II).

**Web portal.** An information technology application that organizes data and information in an intranet environment. Web portals generally include multiple tools and services such as databases, document repositories, search engines, and like facilitators of information work. Web portals are very prominent at the present in knowledge management projects (see Chs. II and IV).

**Work.** The context of purposeful action in an organization. Work drives performance and depends upon knowledge (see Ch. I).

**Work process.** The sequence of activities associated with a workflow and required to produce work in the organization (see Ch. I).

**Workflow.** A dynamic movement of work through an organization. Workflows drive performance dynamically and depend upon knowledge flows (see Ch. I).

**Workflow system.** An information technology application focused on supporting information workflows (see Chs. I and IV).