

Knowledge Management Glossary

Knowledge Research Institute, Inc. and Other Sources.

A

Abductive Reasoning: A special case of inductive reasoning resulting in specific assertions that imply the available information in context of the background knowledge without logical certainty. Example: *Premise:* "Those dogs are mastiffs." *Background knowledge:* "All Erik's dogs are Mastiffs." *Hypothesis:* "Perhaps those dogs are Erik's."

Acquisition: (Also see Knowledge Acquisition) Knowledge may be acquired and represented for inclusion in a knowledge model. Acquisition can be performed by eliciting knowledge from a domain expert, inducing knowledge from examples, porting knowledge from databases, and by other methods.

Action Space: The realm, the "space," within which a person – or enterprise – is competent, willing, comfortable or otherwise prepared to make decisions and act. The Action Space is not a passive domain with fixed boundaries. It is formed by the creative capabilities, methodologies and attitudes, mentalities and motivations that allow actors to perform regular tasks and consider novel actions and innovate within the boundaries of what they find to be permissible and acceptable and is closely related to what is considered to be allowable.

Actor: An agent that perform actions – predominantly a person but can be an organizational entity or a computer programmed to handle situations.

Adaptive learning: See: Single-Loop Learning

Adjacent Function: A business function that exchanges (provides or receives) consultation or collaboration resources, information, or secondary work products with the target function.

After action review: A process developed by the US Army to help teams to learn quickly from their successes and failures and share their learning with other teams. Involves conducting a structured and facilitated discussion after a task or project has been completed to review what should have happened, what actually happened and why it happened; this allows participants to learn how to sustain strengths and improve on weaknesses in subsequent tasks or projects.

AI Technologist: A professional with good applied knowledge of basic AI techniques and selected tools used in the professional's environment. AI technologists are capable encoders of knowledge from codified knowledge and may be proficient AI programmers.

Artificial Intelligence (AI): AI is sub field of computer science concerned with pursuing the possibility that a computer can be made to behave in ways that humans recognize as 'intelligent' behavior in each other. Applied AI becomes a broader field than AI, including cognitive, social and management sciences.

Artificial intelligence: A broad term describing the field of developing computer programs to simulate human thought processes and behaviors.

Asset Management Mentality: Management attitude and practice required manage intangible assets with the same objectives as for tangible assets. The mentality to focus on operational and strategic objectives to create, renew and maintain, safeguard, and utilize and leverage Intangible Capital throughout the enterprise.

Automated Knowledge: Explicit knowledge that has been embedded in an automatic device (such as a computer).

Automatic Knowledge: The lowest abstraction level of conceptual knowledge, where we hold *Routine Working Knowledge*. We know this knowledge so well that we have automated it. Most has become tacit -- we use it to perform tasks automatically -- without conscious reasoning.

Automatic or Automated Knowledge: The lowest abstraction level of tacit knowledge. People know this knowledge so well that it has been automated and is used to perform tasks automatically -- without conscious reasoning.

B

Backward-Chaining: A (computerized) search technique used in production (i.e., "if-then" rule) systems. Begins with the action clause of a rule and works backward through a chain of rules in an attempt to find a verifiable set of condition clauses. (Also termed "goal-oriented reasoning" or "top-down search.") Inference engines backward-chain from one "if-then rule" to other rules in the knowledge base to find new values needed to test if-conditions stated in the rule.

Balanced scorecard: A business model developed by Kaplan and Norton as a tool to measure organizational performance against both short and long-term goals. The balanced scorecard is designed to focus managers' attention on those factors that most help the business strategy and so alongside financial measures, it adds measures for customers, internal processes and employee learning. Some organizations have used the balanced scorecard model in setting and measuring knowledge management strategies.

Basic Knowledge Analysis (BKA): A relatively extensive analysis and characterization of the knowledge in the task environment. It focuses on how knowledge is held, used, etc., and encompasses Task Environment Analysis (TEA), Critical Knowledge Function Analysis (CKFA), business function analysis, and knowledge acquisition -- or knowledge elicitation and modeling.

Benchmarking: The practice of comparing the performance of your organization, department or function against the performance of 'the best' - whether they be other organizations, industry standards or internal departments. The aim is to look at how well you are doing compared to others in the same field or industry, and to learn from their best practices as a basis for improving your own.

Best practice (or: Good practice): A process or methodology that has been proven to work well and produce good results, and is therefore recommended as a model. Some people prefer to use the term 'good practice' as in reality it is debatable whether there is a single 'best' approach.

Blackboard Systems: Knowledge-based systems that consist of several separate reasoning processes that use a "blackboard" to "post" intermediate results or information that needs to be communicated between the various systems. Blackboard systems may be used for multiple-hypothesis reasoning.

Browser: See: Web Browser

C

Capacity building: A term sometimes used in knowledge management to describe the process of enhancing an organization's ability to implement knowledge management principles and practices.

Case-Based Learning: Approach to learning using "cases" (stories, scenarios, descriptions of real events, etc.) to illustrate the material to be internalized. Case-based learning is supportive of building mental reference models.

Case-Based Reasoning (CBR): Reasoning approach often used by people but also implemented as KBS reasoning strategy. In case-based reasoning we compare the present situation or condition to previously experienced situations (reference cases) and interpolate between the most likely ones to arrive at conclusions for how to handle the present case.

CBT: See Computer-Based Training.

Certainty Factor: Either a number supplied by an expert system to indicate the system's level of confidence in the conclusion, or a number supplied by the user of an expert system to indicate the user's level of confidence in the validity of the information supplied to the system.

Champion: A person who proactively promotes something with the aim of persuading others of its benefits.

Chief Information Officer (CIO): A senior position with strategic responsibility for information management and information technology.

Chief Knowledge Officer (CKO): A senior position with strategic responsibility for knowledge management.

Chunking: A mental activity that allows aggregating several (typically five to nine) entities such as concepts into a single, new concept.

CIO: See Chief Information Officer

CKF: See Critical Knowledge Function.

CKFA: Critical Knowledge Function Analysis.

CKO: See Chief Knowledge Officer

Closed System: A system-theoretic concept – A system that is isolated from its environment such that its final state is determined by its initial state.. Many physical systems are examples of closed systems which in addition have manipulated and observable input variables that will change their states. The states of such closed systems are “observable.” Hence they are “identifiable” and “controllable” in contrast to open systems.

Coaching: A one-to-one relationship that aims to bring about individual learning and performance improvement, usually focusing on achieving predefined objectives within a specific time period. The role of the coach is to create a supportive environment in which to challenge and develop the critical thinking skills, ideas and behaviors of the person being coached, so that they might reach their full potential. Related term: Mentoring.

Codification: Knowledge codification deals with obtaining, characterizing, and validating knowledge. It includes of elicitation or acquisition, analysis, and synthesis (rational reconstruction) of knowledge to generate internally consistent knowledge models that are congruent with domain knowledge as held by experts or existing as previously codified bodies of knowledge. The process of getting people's knowledge into a form by which it can be communicated independently of those people. The most common method is writing things down and putting them into documents and databases. Other methods include pictures, and sound and video recordings. Related term: Knowledge Harvesting

Cognition: The act or process of knowing (Webster, 1986).

Cognitive Engineering: A recently coined term to denote the professional field concerned with analysis and synthesis of systems which interact with human cognitive functions. Cognitive engineering encompasses: Human behavior in the real target world; ecological aspects of that world; semantic contents of the target domain; behavior and performance; and implications of changing cognitive-related aspects of the target domain.

Cognitive Science: The field which investigates the details of the mechanisms and processes of human intelligence (such as learning, memory, recall, decision making) to determine the procedures and functions which produces and utilizes that intelligence.

Cognitive Style: An individual's mental approach and reasoning style. Cognitive styles include preferences for graphic or verbal representations of concepts, hemispheric dominance, and so on.

Collaboration, Collaborative working: A generic term that simply means teamwork or a group effort. It also has a more specific meaning in knowledge management, where it is often used to describe close working relationships involving the sharing of knowledge.

Communities of interest (CoI): Networks of people who share a common interest in a particular topic, either work-related or peripheral to work, and who come together informally to share knowledge on that topic. Related term: Communities of practice.

Communities of practice (CoP): Networks of people who work on similar processes or in similar disciplines, and who come together to develop and share their knowledge in that field for the benefit of both themselves and their organization(s). They may be created formally or informally, and they can interact online or in person.

Competence: The capacity and capability of a person or other actor to function with a desired effectiveness – the ability to deliver quality work within a particular domain.

Competitive advantage: A widely-used term in the private sector to describe something that differentiates a company from its competitors in the same industry and makes it more likely to gain profits than the others.

Completed Staff Work: The study of a problem and presentation of a solution, with alternatives, to a manager, so that all that remains to be done by the manager is to indicate approval or disapproval of the completed action.

Computer-Based Training (CBT): Training program delivered by interactive computers. Modern CBTs include multimedia (sounds, video clips) hyper-links, and may also have embedded intelligence to guide or challenge students. Some CBTs allow students to react to simulated real-life situations (such as being confronted by angry customer) and will record student's behavior as computer changes the path of interaction.

Concept Hierarchy: A hierarchy of related concepts, particularly as they relate to a particular position, role, task, or activity. Concept hierarchies build on concepts that are consolidated through chunking and are related to semantic nets and knowledge maps.

Concept Net: A net(work) of related concepts, often pertaining to particular situation. The connections between concept nodes may be specified as to relation type.

Concept: An abstract or general idea often generalized from specific instances. A concept can be a mental model and be tied to other concepts through associations.

Conceptual Blending: The human capability to integrate and find new meaning in large amounts of knowledge coming from different sources and that may be semantically distant from one another.

Conceptual Knowledge: Abstract mental models of the world. **Concepts, Perspectives, and Gestalts** are meta-models for complex situations built from observations and available facts and data. Conceptual knowledge includes abstract images such as how to view the economic situation, how to think about behavior and operating status of difficult chemical plants (when the operator says: "It is unstable today"), the frame of reference applies to a particular competitive situation, and so forth.

Content management: 'Content' in this context generally refers to computer-based information such as the content of a website or a database. Content management is about making sure that content is relevant, up-to-date, accurate, easily accessible, well organized etc, so that quality information is delivered to the user.

CoP: Abbreviation for Community of Practice

Corporate memory: See: Organizational Memory.

Critical Knowledge Function (CKF): Knowledge-related situation or condition that warrants KM attention. CKFs can be characterized by five factors: 1. Type of knowledge (understanding, expertise or skill) involved in performing a task; 2. Business use of that knowledge; 3. Constraint that prevents knowledge to be utilized fully, the vulnerability of the situation, or the unrealized opportunity that is not exploited; 4. Opportunities and alternatives for managing (i.e. improving) the CKF; 5. Expected incremental value of improving the situation – release knowledge constraint, exploit (take advantage of) the opportunity to use knowledge differently.

Critical Thinking: Effective mental methodologies, strategies, and representations people use for handling situations, decision making and acting, learn and to innovate.

CRM: Abbreviation for Customer Relations Management

Culture: The culture of an organization is an amalgamation of the values and beliefs of the people in an organization. It can be felt in the implicit rules and expectations of behavior in an organization where, even though the rules are not formally written down employees know what is expected of them. It is usually set by management whose decisions on policy usually set up the culture of the organization. The organizational culture usually has values and beliefs that support the organizational goals. (from <http://opax.swin.edu.au/~388226/howto/it2/o_cultre.htm>)

Customer capital: The combined value of all the relationships an organization has with its customers - including current, past, and potential customers. This includes intangible factors such as customer opinions of, and loyalty to, the organization or its products or services. Customer capital is one component of Intellectual Capital. It includes customer goodwill and relations and non-financial aspects of customer contracts and obligations

Customer relationship management: A business strategy based on selecting and proactively managing the most valuable customer relationships. It requires a customer-focused philosophy to support effective marketing, sales and customer service processes.

Data mining: A technique for analyzing data in very large databases and making new connections between the data in order to reveal trends and patterns.

Data: A set of facts, concepts or statistics that can be analyzed to produce information.

Database: Information stored in a computer for subsequent retrieval. Databases are structured to support data architectures; modern databases are relational databases. Data bases may be "flat," relational, or object-oriented.

Declarative Knowledge: Facts about, and relations between, objects (such as abstract concepts or physical objects), events, and situations stated in some representation such as rules or clauses.

Deductive Reasoning: Reasoning to deduce information about the situation under analysis, such as deducing facts or premises from hypotheses and rules, given the background or domain knowledge.

Deutero-learning (DL). Deutero-learning occurs when organizations learn how to carry out single-loop and double-loop learning. (Argyris and Schön 1978.)

Document management: Systems and processes for managing documents including the creation, editing, production, storage, indexing and disposal of documents. This usually refers to electronic documents and uses specific document management software.

Document: A record of an event or knowledge, taken so that the information will not be lost. Documents are usually written, but they can also be made up of images or sound. Documents can also be put into electronic or digital form and stored in a computer.

Domain Expert: A person with expertise in the domain of the target knowledge area such as a knowledge-based system being developed. The domain expert often works closely with the knowledge engineer (particularly the knowledge professionals) to allow capturing of the expert's knowledge for codification into a knowledge model, which can then be encoded into a knowledge base.

Domain Knowledge: See Work-Domain Knowledge.

Domain: A bounded part of a larger system. It may be a specific area of knowledge such as "the domain of financial knowledge." At times, it may be the knowledge or expertise area of a knowledge-based system.

Double-Loop Learning (DLL). DLL occurs when, in addition to detection and correction of errors, the organization is involved in the questioning and modification of existing norms, procedures, policies, and objectives. DLL involves changing the organization's knowledge-base or firm-specific competencies or routines (Dodgson, 1993). DLL is also called higher-level learning (Fiol and Lyles, 1985), generative learning or learning to expand an organization's capabilities (Senge, 1990), and strategic learning (Mason, 1993). (Initially defined by Argyris and Schön 1978.)

Double-loop learning (or: Generative learning): In contrast to Single Loop Learning which involves using knowledge to solve specific problems based on existing assumptions and often based on what has worked in the past, double-loop learning goes a step further and questions existing assumptions in order to create new insights. For example, take the problem 'how do we prevent earthquakes from killing people?'. The single-loop answer would be to learn how earthquakes happen and try to predict them in order to be prepared. The double-loop answer would question our notion of 'earthquake' and might conclude that earthquakes do not kill people, falling buildings do.

Downstream Function: A function which receives the target function's work products.

E

E-Business The use of electronic information systems (especially internet technologies) in business processes.

E-Commerce: The use of electronic information systems (especially internet technologies) to perform transactions i.e. buy and sell things.

Economic Value Added (EVA): A measure of financial performance calculated by determining net operating income and subtracting charges for capital expended to produce that income (Economic value added equals net operating income - capital charge)

Effective Behavior: Behavior that achieves implementation of objectives and goals.

E-Government: The delivery of government services using electronic information systems (especially internet technologies).

E-Learning: The use of electronic information systems (especially internet technologies) to deliver learning and training.

Elicitation: The process of obtaining domain knowledge from experts through one of several elicitation methods such as interviews, observation, simulation, and so on.

E-Mail: Short for electronic mail. Uses internet technologies to send messages and documents to and from computers around the world in a matter of seconds. Sending or receiving e-mail requires internet access and an e-mail address.

Encoding: Encoding of knowledge involves translating codified knowledge models to a representation such as that required for an expert system tool or shell. Encoding is similar to “programming,” and may in many instances include computer programming to augment tools or shells. Encoding may fully be a programming task as when an expert system is directly implemented in LISP Prolog, or another computer language.

Episode: A *relatively independent incident or scene* which occurs in the context of a larger situation -- a script or story line. As such *episodes have meaning*. An episode is the collection of distinct steps we observe as the situation unfolds. We may choose to divide a situation into many episodes depending on which detail we wish to work with. Or episodes may be relatively aggregate entities consisting of several events.

Episodic Memory: Human memory which stores recollections of personally experienced episodes and events as they occurred without further analysis or integration.

Event: An *isolated occurrence within a particular situation*. Events are concrete and detailed -- the numerous distinct steps which occur as a situation unfolds. Events are normally observable and are typically, by themselves, without context and meaning.

Evidence-based medicine, Evidence-based practice: Evidence-based medicine involves integrating individual clinical experience with the best available external clinical evidence from systematic research when making decisions about patient care. Evidence-based practice is a term strongly associated with healthcare and so is often taken to mean the same, although it is now also being used in other fields so can have a broader meaning.

Exit interview: A survey that is conducted with an employee when he or she leaves an organization. The information from each exit interview is used to provide feedback on why employees are leaving, what they liked about their employment and what areas of the organization need improvement. Exit interviews can also be used as part of knowledge harvesting to extract knowledge from the departing employee so that it is kept in-house.

Expectational Knowledge: Our *Expectations, Judgments, Working Hypotheses, Associations, and Beliefs* are derived mental models and connections that lead us to opine how situations -- simple and complex -- might evolve and how to handle them. Expectations are partly based on working hypotheses for how the situations work and what influences them. They include our associations that often become premises and reasoning stepping stones for potential conclusions and interpretations of contexts. Beliefs are formed by expectations and working hypotheses and are based on concepts, perspectives, and facts and confirmed data.

Expectational Knowledge: Human Expectations, Judgments, Working Hypotheses, Associations, and Beliefs are derived mental models and connections that leads to opinions on how situations – simple and complex – might evolve and how to handle them. Expectations are partly based on working hypotheses for how the situations work and what influences them. They include our associations that often become premises and reasoning stepping stones for potential conclusions and interpretations of contexts. Beliefs are formed by

expectations and working hypotheses and are based on concepts, perspectives, and facts and confirmed data.

Expert Networks: A formal or informal arrangement that allows people with operational problems access experts for assistance.

Expert System: A knowledge-based computer program containing expert domain knowledge about objects, events, situations, and courses of action, which emulates the reasoning process of human experts in the particular domain. The components of an expert system include: (a) The Knowledge Base; (b) Inference Engine; and (c) User Interface. Types of expert systems include rule-based systems and model-based systems. A branch of Artificial Intelligence (AI).

Expertise directory, Experts directory (or: Skills directory): A staff directory in the form of a database that includes details of people's skills, knowledge, experience and expertise so that users can search for people with specific know-how.

Explicit Knowledge: Knowledge which "is not tacit or implicit," that is, it has been made available for inspection by being explicated through oral or written language, expert system rules, computer programs, diagrams, or in any other manner. Knowledge that has been explicated and made available for examination as personal knowledge about which a person can talk or write or as knowledge captured in documents, video clips, computer programs through oral or written language, expert system rules, computer programs, diagrams, or in any other manner, etc. Knowledge that can be easily expressed in words or numbers, and can be shared through discussion or by writing it down and putting it into documents, manuals or databases. Examples might include a telephone directory, an instruction manual, or a report of research findings. Structural knowledge is often explicit.

Externalization: The process of making tacit knowledge explicit. Related term: Internalization.

Extranet: A website that links an organization with other specific organizations or people. Extranets are only accessible to those specified organizations or people and are protected via passwords.

F

Factual Knowledge: Our knowledge of what we "know to be true" consists of *Facts, Confirmed Data, Known Causal Chains, Remembered Sensory Inputs and Episodes*. Much of it is retrieved from memory in the form of declarations;. It is semantic knowledge pertaining to particular domains and is organized to be relevant to particular contexts. When we elicit and codify knowledge in external knowledge bases, most of the initial knowledge is of this type. It is knowledge of isolated facts -- data and information -- and of relations between facts and concrete and reality-connected details. (Example: knowing the constants of the metric system and how they relate.) Also see Pragmatic Knowledge.

Firewall: Software that protects an organization's computer systems from problems such as viruses that can be carried by internet technologies or hackers seeking to gain unauthorized access.

Forward Chaining: A search technique used in production (i.e., "if-then" rule) systems, which begins with the condition clause of a rule and works "forward" through a chain of rules in an attempt to activate implied action rules. (Also termed "data-driven reasoning" or "bottom-up search.") During forward chaining, the inference engine searches for if-condition matches in other rules in the knowledge base when new values are generated by then-action in rules that have been "fired."

Fuzzy Logic: A formal type of logic that is defined to work with fuzzy operations.

Fuzzy Reasoning: A reasoning method that is based on fuzzy logic. It is similar to Qualitative Reasoning.

Fuzzy Systems: Knowledge-based systems which employ fuzzy reasoning.

G

General Principles: Mental models of underlying principles within a domain.

Generative learning: See Doubleloop Learning.

Goal Setting Knowledge: See Idealistic Knowledge.

Good practice: See Best Practice

Government Secure Intranet (GSI): An intranet that links UK government departments.

Groupware: Computer software applications that are linked together by networks, and so allow people to work together and share electronic communications and documents.

Harvesting: See Knowledge Harvesting.

Hermeneutics: The branch of epistemological philosophy which deals with methodological interpretation of the intended meanings, often of written or verbal communications.

HTML: Abbreviation for HyperText Markup Language. The major language of the internet's world wide web. Web sites and web pages are written in HTML, which basically comprises a set of instructions for creating web pages.

Human capital: The knowledge, skills and competencies of the people in an organization. Human capital is one component of Intellectual Capital. The enterprise's human capital consists of the knowledge, understandings, skills, experience, and relationships of its employees. Human capital is the property of employees and is only leased or rented by the enterprise.

Idealistic Knowledge: The highest abstraction level of conceptual knowledge at which we hold *Vision and Paradigm Knowledge*. Part of this knowledge is well known to us and explicit -- we work consciously with it. Much of it -- our visions and mental models -- is not well known, it is tacit, and only accessible nonconsciously.

Implicit Knowledge: Knowledge that is contained implicitly in oral or written language, actions (also when videotaped or provided as part of a hypermedia system), trained neural networks, embedded in technology, culture, practices, and so on.

Implicit Learning: The process of learning without intending to learn (by being engaged in an activity or by passive observation), without being aware of learning and resulting in tacit – and mostly inaccessible – knowledge.

Inductive Reasoning: Reasoning to generate hypotheses based on background or domain knowledge and information such as premises, statements, or facts. Example: *Premise:* "The engine is powerful. " *Background knowledge:* "Engine is part of a car. " *Hypothesis:* "The car is powerful." Induction can also be used to generate hypotheses from background knowledge and other hypotheses. Rules are often used to perform inductive inference.

Inference Engine: The component of a computerized knowledge-based system which controls its reasoning operation by selecting which rules to use, accessing and executing those rules, and determining when an acceptable solution has been found. This component is sometimes called the "control structure" or the "rule interpreter."

Informatics: A term that is used in a variety of ways. Some regard it as the study of the impact that technology has on people. Some take a broader view and consider it to be the science of information and information technology. Others regard it as being broader still, referring to the creation, recognition, representation, collection, organization, transformation, communication, evaluation and control of information in various contexts.

Information Audit: A method of reviewing and mapping information in an organization. An information audit looks at things like what information is needed, what information there currently is, where it is, in what forms, how it flows around the organization, where there are gaps and where there is duplication, how much is it costing, what its value is, how it is used etc.

Information Communication Technology (ICT): Technology that combines computing with high-speed communications links carrying data, sound and video.

Information Management: The management of an organization's information resources in order to improve the performance of the organization. Information management underpins knowledge management, as people derive knowledge from information.

Information overload: A state where a person has so much information that they are no longer able to effectively process and make use of it.

Information technology (IT): A term that encompasses the physical elements of computing including servers, networks and desktop computing which enable digital information to be created, stored, used and shared.

Information: Information describes a particular circumstance or case. Information consists of facts or data and may take on any one of several forms, levels of abstractions, and degrees of certainties. Information is used by *knowledge* to interpret or reason about a particular circumstance or case. *The role of information is description.* Data that has been organized within a context and translated into a form that has structure and meaning. (Note: while most people have an idea about what information is, it is rather difficult to define in a meaningful way).

Innovation: The creation of something new or different; the conversion of knowledge and ideas into a new benefit, such as new or improved processes or services.

Intangible assets: The non-physical resources of an organization. An example might be the reputation linked to a brand name such as Mercedes or Microsoft, or the loyalty of customers to a company such as Marks & Spencer. These assets are not generally accounted for in an organization's financial statements, but they are of great value to the organization.

Integrative Management Culture: When an enterprise builds and orchestrates an internal practice to deal systematically and deliberately with knowledge by having people share insights and seek assistance from one another, a new and open culture emerges. People open up and discuss difficult issues, emerging ideas, and tentative opportunities with one another. They take mental risks that would be unthinkable in conventional environments. They seek collaboration to achieve better results quicker, and build upon ideas of others and let others build on their own ideas. By opening up to new approaches and perspectives, and by building on the capabilities of others instead of only relying on their own, they expand their action space. As people expand action spaces, and become more effective through capable collaboration, the enterprise becomes smarter and more effective. Complex tasks are addressed better and faster, and innovations abound and make the enterprise more capable and able to engage in activities that previously were infeasible.

Intellectual assets management: The management of an organization's intellectual assets in order to improve the performance of the organization. In theory, synonymous with knowledge management but in practice, intellectual assets management tends to focus on issues relating to intellectual property such as organizing and exploiting patents, copyrights, trademarks and other intellectual property rights.

Intellectual assets: See Knowledge Assets.

Intellectual Capital: The sum of the enterprise's human capital, customer capital and structural capital. Intellectual capital is part of the enterprise's intangible capital. The value, or potential value, of an organization's intellectual assets (or knowledge assets). An attempt by organizations to place financial value on their knowledge.

Intellectual property rights: The legal rights associated with Intellectual Property.

Intellectual property: Explicit intellectual assets (or Knowledge Assets) that are protected by law. Includes things like patents, trademarks, copyrights, licenses etc. Intellectual Property is part of Structural Capital.

Internalization: The process of absorbing explicit knowledge and making it tacit. Opposite of Externalization.

Internet: The internet is a vast system of computers that are 'networked' (linked together) to exchange information and resources. Through the use of computers connected to telephone lines, the internet makes it easy for people all over the world to communicate with each other. It is a shared global resource that is not owned or regulated by anyone.

Intranet: A computer network that functions like the internet, but the information and web pages are located on computers within an organization rather than being accessible to the general public.

IT literacy: A person's competency in using information technologies.

IT: Abbreviation for Information Technology and for Information Communication Technology (ICT).

K

KADS: “Knowledge Analysis and Documentation System” or “Knowledge Analysis and Design Support” developed under the sponsorship of ESPRIT.

KADS-OBJECT: Knowledge representation and analysis approach generally based on the KADS model.

KBS: See Knowledge-Based System.

KFA: See Knowledge Flow Analysis:

K-I Activity or Task: See Knowledge-Intensive Activity.

KMap: See Knowledge Mapping.

Know-how: Skill or capability derived from knowledge and experience.

Knowledge: Operational definitions for this book: **1.** The content of understandings and action patterns that govern sensemaking, decision making, execution, and monitoring. **2.** Knowledge consists of facts, perspectives and concepts, mental reference models, truths and beliefs, judgments and expectations, methodologies and know-how. **3.** Knowledge is used to interpret information about a particular circumstance or case to handle the situation. Knowledge is about what the facts and information means in the context of the situation. **4.** Knowledge is possessed and represented on many conceptual levels, in many forms, of many types, and in many domains. **Other relevant definitions:** *A. Formal Language Use Definition:*¹ (**a**) Cognizance; **2 a** (1): The fact or condition of knowing something with familiarity gained through experience or association; (2): acquaintance with or understanding of a science, art or technique; **b** (1): the fact or condition of being aware of something; (2): The range of one’s information or understanding; **c:** The circumstance or condition of apprehending truth or fact: Cognition; **d:** The fact or condition of having information or of being learned; **4 a:** The sum of what is known; the body of truth, information, and principles acquired by mankind. *B. Epistemological Definition:* The body of internalized data, concepts, perspectives, judgments, strategies, and so on, *that a person believes to be true.* *C. Operational Definition:* Truths, perspectives, judgments, and methodologies that are available to handle specific situations. Knowledge is used to interpret *information* about a particular circumstance or case to handle the situation. Knowledge is about what the facts and information means in the context of the situation. **Yet other definitions of knowledge:** Collins English Dictionary definition is "the facts, feelings or experiences known by a person or group of people". Knowledge is derived from information but it is richer and more meaningful than information. It includes familiarity, awareness and understanding gained through experience or study, and results from making comparisons, identifying consequences, and making connections. Some experts include wisdom and insight in their definitions of knowledge. In organizational terms, knowledge is generally thought of as being 'know how', 'applied information', 'information with judgment' or 'the capacity for effective action'.

Knowledge-Based System (KBS): A computer-based system which contains explicit or implicit domain knowledge used specifically for reasoning about specific situations. Examples of KBSs are case-based reasoning (CBR) systems, expert systems, and neural nets.

Knowledge-Intensive Activity (K-I Activity): An activity that requires extensive knowledge to perform appropriately. As a result of the depth of knowledge required, the knowledge may be internalized (and automated) by the performer. Consequently, many K-I activities will be executed within the performer’s mind -- hidden from outside observation -- and are therefore difficult to identify and characterize.

Knowledge-Intensive Work: All work is invariably knowledge-intensive (K-I), also when some part of it has become *automatic*. It frequently requires focused thinking and explicit reasoning and involves nonroutine conditions which require expertise to handle. Even highly automatic clerical work, such as “uncomplicated” correspondence filing, requires extensive judgment and concept knowledge, although much is so familiar that proficient office workers have automated it and perform complicated activities within fractions of a second.

Knowledge about Knowledge: Understanding what knowledge is about; how it is created, used, and structured

¹ Webster’s Ninth New Collegiate Dictionary (1986).

-- as studied by the field of epistemology (also see Metaknowledge).

Knowledge Analysis: A general term for investigation, characterization, and structuring (modeling) of knowledge as possessed by experts or other knowledge workers, required to deliver quality work, used in practice, and so on. Knowledge analysis may involve the use of specific methods, including basic knowledge analysis (BKA), critical knowledge function analysis (CKFA), knowledge mapping (KMap), knowledge use and requirements analysis (KURA), knowledge scripting and profiling (KS&P), knowledge flow analysis (KFA), and KADS-OBJECT-based analysis.

Knowledge Assets (or: Intellectual Assets): Those parts of an organization's Intangible Assets that relate specifically to knowledge, such as Know-How; Best Practice; Intellectual Property; and the like. Knowledge assets are often divided into human (people, teams, networks and communities), structural (the codified knowledge that can be found in processes and procedures) and technological (the technologies that support knowledge sharing such as databases and intranets). By understanding the knowledge assets an organization possesses, the organization can improve its ability to use them to best effect and also to spot any gaps that may exist.

Knowledge Audit: A method of reviewing and mapping knowledge in an organization including an analysis of knowledge needs, resources, flows, gaps, users and uses. A knowledge audit will generally include aspects of an Information Audit but is broader than an information audit. Survey and characterization of the status of knowledge in an organization. Knowledge audit may refer to identifying specific knowledge assets such as patents and the degree to which these assets are used, enforced, and safeguarded.

Knowledge Base (KB): The component of a knowledge-based system which contains the system's domain knowledge in some representation suitable for the system to reason with. Knowledge in knowledge bases is typically represented in a standard format. The fundamental body of Knowledge available to an organization, including the knowledge in people's heads, supported by the organization's collections of Information and Data. An organization may also build subject-specific knowledge bases to collate information on key topics or processes. The term 'knowledge base' is also sometimes used to describe a database of information.

Knowledge Broker: A person who facilitates the creation, sharing and use of knowledge in an organization. Many organizations have created knowledge broker roles such as 'Knowledge Co-coordinator'. The term knowledge broker is also sometimes used to describe companies or individuals that operate commercially as knowledge traders or provide knowledge-related services.

Knowledge Economy: An economy in which knowledge plays a predominant part in the creation of wealth.

Knowledge Engineer: Specialists responsible for analyzing knowledge-intensive functions to design appropriate knowledge management activities such as technical development of a knowledge-based system. Knowledge engineers may be "knowledge technologists," focusing on the content and functionality of knowledge use in a knowledge-based function, or "AI technologists" focusing on implementation of a knowledge-based system. Only rarely is a knowledge engineer both an AI technologist and a knowledge technologist.

Knowledge Engineering: The professional activities associated with acquiring or eliciting, codifying, and encoding knowledge, conceptualizing and implementing knowledge-based systems, and engaging in activities to formalize knowledge and its use -- particularly through application of artificial intelligence.

Knowledge Enhanced Government (KEG): A government-wide policy framework for knowledge management.

Knowledge Flow Analysis (KFA): Explicit analysis of existing or potential flows of knowledge within an organization. KFA may focus on threats, opportunities, weaknesses, and strengths of knowledge flows, and on flows in four dimensions: (a) application of knowledge to work objects; (b) learning to perform work better; (c) application of knowledge to improve the system of production and service; and (d) application of knowledge to improve the products and services themselves.

Knowledge flows: The ways in which knowledge moves around, and in and out of, an organization.

Knowledge harvesting: A set of methods for making Tacit Knowledge more explicit - getting people's

knowledge into documents, so that it can be more easily shared with others. Related term: Codification.

Knowledge Holder: The person (domain expert) who holds the knowledge of interest. Knowledge holders can behave in different ways and can be classified as a: "Professional Practitioner;" "Practical Knowledge-Worker;" "Performer;" or "Communicating Negotiator."

Knowledge Management: Knowledge Management is the systematic, explicit, and deliberate building, renewal, and application of knowledge to maximize an enterprise's knowledge-related effectiveness and returns from its knowledge and intellectual capital assets. The field covers deliberate and systematic analysis, synthesis, assessment, and implementation of knowledge-related changes to attain a set of objectives and to monitor that KM activities are carried out appropriately and meet their objectives. It comprises activities needed to facilitate direct knowledge-related work. KM includes fostering "Knowledge Asset Management Mentality" required to create, maintain, and utilize appropriate Intangible Capital. There is a wide variety of definitions of knowledge management such as from knowledge management consultants Tfpf: "The creation and subsequent management of an environment which encourages knowledge to be created, shared, learnt, enhanced, organized and utilized for the benefit of the organization and its customers".

Knowledge Management Activity: Distinct knowledge-related changes to manage knowledge such as analyzing a situation using KM analysis tools, creating and implementing KM capabilities, practices and initiatives, or engaged in KM practices, utilizing or operating KM capabilities.

Knowledge Management Solution: Strictly speaking, a solution to a knowledge management problem, or the use of knowledge management techniques to solve an organizational problem. However, a "knowledge management solution" may refer to a piece of knowledge management technology or software.

Knowledge Management Strategy: A detailed plan outlining how an organization intends to implement knowledge management principles and practices in order to achieve organizational objectives.

Knowledge Manager: A role with developmental and operational responsibility for promoting and implementing knowledge management principles and practices.

Knowledge Map: Variant of semantic network. The TCU knowledge mapping system generates a special kind of knowledge maps with characterizations of the links between concepts using a specific grammar.

Knowledge Mapping (KMap): The methodology utilized to generate knowledge maps.

Knowledge Mapping: A process to determine where Knowledge Assets are in an organization, and how knowledge flows operate in the organization. Evaluating relationships between holders of knowledge will then illustrate the sources, flows, limitations, and losses of knowledge that can be expected to occur.

Knowledge Model: Knowledge models take many forms. They may be documentation of domain knowledge on paper, in computer-based knowledge base, or videotaped "show-and-tell" for performing a particular task. Knowledge models may be represented using a formal "knowledge representation," it may be in natural language as a narrative, a set of diagrammatic representations, and so forth.

Knowledge Professional (KP): A professional who focuses on optimal creation, organization, availability, and use of *knowledge* in a domain or within a business function. Knowledge professionals have applied understanding of task environment analysis, various KM approaches, business use of knowledge, and support of knowledge workers with automated reasoning and other means. Knowledge professionals may be trained in cognitive sciences, artificial intelligence, philosophy, and management sciences.

Knowledge Profiling: A method to characterize particular knowledge domains in terms of specific knowledge areas (often less than 20) and the levels of existing or desired proficiency for individual roles or persons in each of these areas. A polar coordinate graphical display is often used to portray the resulting "profiles."

Knowledge Repository: A place where knowledge is gathered and stored and can be accessed and used by other people. It may be a Community-of-Practice or one or several experts. It may be a physical place like an R&D team, a library, a "virtual" place like an interactive website or an online discussion board, or a place where people gather such as a café or an informal meeting room or discussion area created to encourage knowledge sharing. A low-tech knowledge repository could be a set of file folders. A high-tech knowledge

repository might be based on a database platform.

Knowledge Representation: The formal structures used to store information in a knowledge base in a form which supports the reasoning approach to be employed. Knowledge representation techniques include "production rules" ("if-then rules"), logic (often "first-order logic"), semantic networks, frames, and scripts.

Knowledge Script: A step-by-step representation of knowledge-related work processes. Knowledge scripts may specifically focus on knowledge-intensive activities to ensure that they are properly represented.

Knowledge Scripting and Profiling (KS&P): A method for explicating K-I work performed a function and describing the particular knowledge, skills, and personal characteristics required to deliver routine and exception work. KS&P is used to identify the requirements for different work-roles. KS&P produces knowledge scripts and profiles.

Knowledge Technologist: A professional who focuses on codification and automation of knowledge content in a domain. The knowledge technologist must have applied understanding of knowledge elicitation, analysis, and modeling, and support of knowledge workers with automated reasoning. Knowledge technologists may be trained in cognitive sciences or artificial intelligence.

Knowledge Technology: Technology -- physical and methodological -- for support of knowledge management activities.

Knowledge Use and Requirements Analysis (KURA): A method to identify and characterize the knowledge required to deliver quality work and the actual use of knowledge in the target work functions. KURA relies on several other knowledge analysis and characterization methods such as BKA, KFA, knowledge profiling, etc.

Knowledge Vigilance: The degree to which an enterprise exhibits knowledge awareness and pursues explicit and systematic knowledge management with the understanding that such pursuits are vital for success and viability.

Knowledge Work: Work which requires application of knowledge to a work object. Knowledge work may involve highly abstract knowledge such as when a judge or lawyer assesses the applicability of a precedence, or it may involve concrete knowledge as when a machinist selects feed speed to match a tool to the material to be turned. Knowledge work may be routine as when an underwriter reviews a standard life insurance application, or it may requiring anomalies as when a marketing specialist faces a totally new situation.

Knowledge worker: An employee whose role relies on his or her ability to find and use knowledge.

Knowledge Worker: Individual who makes her/his contributions through exercising intellectual expertise and understanding.

KOA: KADS-OBJECT Analysis.

KS&P: Knowledge Scripting and Profiling.

KURA: Knowledge Use and Requirement Analysis.

L

Learning Models: In the learning sciences, a large number of different types of individual learning have been distinguished. To name a few: Incidental learning, Implicit Learning, Learning by reflection, Simulation-based learning, Case-based learning, Learning by exploring, Goal directed learning

Learning Organization: An organization that views its success in the future as being based on continuous learning and adaptive behavior. It therefore becomes skilled at creating, acquiring, interpreting and retaining knowledge and then modifying its behavior to reflect new knowledge and insights.

Lessons Learned: Lessons learned are concise descriptions of knowledge derived from experiences, that can be communicated through mechanisms such as storytelling, debriefing etc, or summarized in databases. These lessons often reflect on "what we did right," "what we would do differently," and "how we could improve our process and product to be more effective in the future."

Leverage: To realize the inherent value of an asset - physical or knowledge-based - beyond what is currently

being realized. In short, to get more value out of it.

Logic: A technique for drawing inferences which relies on formal rules for manipulating symbols. Logic is a branch of philosophy. Symbolic logic is also considered a branch of mathematics.

M

Machine Learning: An area of AI research which investigates techniques for creating computer programs that can learn from their own experience.

Machine Translation: An area of AI research which attempts to use computers to translate text from one language to another. Machine translation programs often use combinations of natural language understanding and natural language generation techniques.

Mental Model: Mental models are the conceptual and operational representations in the mind of situations, events, etc. that have been experienced or are learned from other sources. These are “real mental models.” “Imaginary mental models” result from thought experiments and self-imagined situations. Kenneth Craik (1943) suggested that the mind constructs “small-scale models” (mental models) of reality that it uses to anticipate events. Such mental models are also used to generate decisions and actions. People construct mental models from what they perceive, imagine or from readings and from communications. Mental models may be visual images or abstract representations of situations. The broader representation of “mental models” mean representations in the human mind of situations, events, etc. that have been experienced or are learned from other sources. These are “real mental models.” Mental models may also result from thought experiments and self-imagined situations to become “imaginary mental models” which may be untrue.

Mental Reference Model: Mental model that can act as a principle, guide, template or example for thinking or action.

Mentoring: Mentoring is a one-to-one learning relationship in which a senior member of an organization is assigned to support the development of a newer or more junior member by sharing his or her knowledge, experience and wisdom with them. Related term: Coaching. (Note: While the strength of mentoring lies in transferring the mentor's specific knowledge and wisdom, in coaching it lies in the coach's ability to facilitate and develop the other's own personal qualities.)

Menu-Based Natural Language: An approach to natural language understanding in which the computer helps build a natural language sentence by presenting “menus” (options lists) of choices that are available in each context and allowing the user to select the options which meet the user's requirements.

Meta Reasoning: Allows a person (or an inanimate system) to know what it knows -- and what it does not know.

Metacognition: Cognition that reflects on, monitors or regulates first order cognition (Kuhn 2000).

Metacognitive Reasoning: Allows a person (or an inanimate system) to know what it knows -- and what it does not know.

Metaknowledge: Normally considered to be “Knowledge about Knowledge” possessed by people or descriptions of knowledge in a physical knowledge base. Much of a person’s metaknowledge is tacit that on the lowest conceptual level consists of “Procedural Metaknowledge and “Declarative Metaknowledge.” On a higher conceptual level metaknowledge is “Metastrategic Knowing” consisting of “Metastrategic Knowledge,” “Metatask Knowledge,” and “Metacognitive Knowing.”

Methodological Knowledge: Provides our methodological approaches and reasoning strategies with the meta-knowledge for how to think and reason within particular contexts and situations, given information about the situations and the background knowledge in terms of facts, data, perspectives, and judgments.

Model-Based Expert System: A type of expert system, usually intended for diagnostic purposes, which is based on a model of the structure and behavior of the device or system it is designed to “understand.”

Model-Based Reasoning: Complex reasoning strategies which allow the use of mathematical models as representations of the domain knowledge.

Natural Language (NL): A language in common use by people to communicate among themselves (Example:

Chinese or English).

Natural Language Generation: The part of natural language-processing research that attempts to have computers present information to their users in a natural language.

Natural Language Interface (NLI): A computer program which allows the user to communicate with a computer in a natural language. An NLI may incorporate both natural language-understanding and natural language-generation capabilities. An NLI is sometimes called a “natural language front end.”

Natural Language Processing (NLP): An area of AI research which allows computers to use a natural language. Natural language processing is divided into natural language understanding and natural language generation.

Natural Language Understanding: The part of natural language-processing research which investigates methods of allowing computers to understand a natural language.

Natural Language: A language in common use by people to communicate among themselves (Example: English).

Neural Nets: A family of reasoning strategies and knowledge representations that are patterned on the neural architecture of the brain. Neural nets often consist of a large number of nodes connected by links that transmit signals. Neural nets must be "trained" using examples to modify the strength of the couplings between nodes to change the net's reasoning behavior. Neural nets are used in a number of applications where the knowledge is amorphous and ill understood, like handwriting interpretation, seismic data interpretation, and so on.

Nonmonotonic Reasoning: A reasoning method which allows retraction of hypotheses, conclusions, or facts given new (and better) information or understanding. Also often supports multiple lines of reasoning (multiple-hypothesis reasoning). Nonmonotonic reasoning is useful where knowledge is not well understood or information is unreliable.

Numeric Processing: The traditional use of computers to manipulate numbers.

O

Object-Oriented System: A system built around “objects” which are independent computer procedures which perform one of its operations when passed a message. Object-oriented systems also employ “inheritance” of characteristics, and “encapsulation.” Most KBS tools and shells are implemented as object-oriented systems.

Object-Oriented View: The perspective of a complex system where the different entities are regarded as independent objects.

Open System: A system-theoretic concept – A system that is integrated with, and continually influenced by its environment. Many open systems, such as human and social systems have scores of unobservable inputs. Moreover, dimensions of their internal states are large and not fully observable. Their internal states cannot be observed or measured. Open systems are “unidentifiable” and “uncontrollable.”

Operational Model: A mental model of procedures for how to perform certain tasks. An operational model is more abstract than a routine and less general than a script. In specific situations beyond prior experience, operational models may be generated by operationalizing scripts.

Organizational Culture: (Also, see **Culture**) In short, 'the way we do things around here'. An organization's culture is a mixture of its traditions, values, attitudes and behaviors. Different organizations can have very different cultures. In knowledge management, an organization's culture is extremely important - if it is not based on qualities such as trust and openness, then knowledge management initiatives are unlikely to succeed.

Organizational Learning: The ability of an organization to gain knowledge from experience through experimentation, observation, analysis and a willingness to examine both successes and failures, and to then use that knowledge to do things differently. While organizational learning cannot happen without individual learning, individual learning does not necessarily produce organizational learning. Organizational learning occurs when an organization becomes collectively more knowledgeable and skillful in pursuing a set of goals.

Organizational Memory: The knowledge and understanding embedded in an organization's people, processes

and products or services, along with its traditions and values. Organizational memory can either assist or inhibit the organization's progress.

Organizational Learning Models: Argyris and Schön 1978 described the following three types of organizational learning Single-loop learning (SLL). Organizational learning occurs when errors are detected and corrected and firms carry on with their present policies and goals. According to Dodgson in 1993, SLL can be equated to activities that add to the knowledge-base or firm-specific competencies or routines without altering the fundamental nature of the organization's activities. (Argyris and Schön 1978.) Double-loop learning (DLL). DLL occurs when, in addition to detection and correction of errors, the organization is involved in the questioning and modification of existing norms, procedures, policies, and objectives. DLL involves changing the organization's knowledge-base or firm-specific competencies or routines (Dodgson, 1993). DLL is also called higher-level learning (Fiol and Lyles, 1985), generative learning or learning to expand an organization's capabilities (Senge, 1990), and strategic learning (Mason, 1993). (Argyris and Schön 1978.) Deutero-learning (DL). Deutero-learning occurs when organizations learn how to carry out single-loop and double-loop learning. (Argyris and Schön 1978.)

P

Pattern-Matching: A human (or computational – AI) reasoning method which recognizes similarities between patterns and objects or events.

Peer assist: A process pioneered by BP-Amoco, in which an individual or team calls a meeting or a workshop in order to tap the knowledge and experience of others before embarking on a project or activity.

Planning and Decision Support: An area of AI research that applies AI techniques to planning and decision-making processes, primarily to assist managers who have decision-making responsibilities.

Planning Systems: A type of AI-based systems used to reason about sequential situations such as scheduling, resolution of time conflicts, and so on. Planning systems may use nonmonotonic reasoning.

Portal: A special web page that organizes access to all of the online resources about a topic, providing a one-stop shop of sorts.

Pragmatic Knowledge: The next lowest abstraction level of conceptual knowledge at which we hold **Decision-Making and Factual Knowledge**. Decision-making knowledge is practical and mostly explicit. It supports everyday work and decisions, is well known, and is used consciously.

Predicate Calculus: A formalization of classical logic which uses clauses of functions and predicates to describe relations between individual entities or symbols.

Procedural Knowledge: Knowledge and information about courses of action that may be sequential in nature. It may in particular refer to sequential steps of a procedure or methodology.

Production Rule: A rule in the form of an “if-then” or “condition-action” statement often used in the knowledge base of an expert system. A production rule typically represents a single heuristic. The **If** (Condition) is called the “antecedent,” the **Then** (Action) is called the “consequent.”

Production System: A knowledge-based system which relies on a reasoning approach that uses knowledge representation in the form of production rules. Production systems consist of a rule base, an inference engine, and a user interface.

Proficiency: Capability to perform.

Protocol Analysis: Structured analysis of verbal protocols to extract knowledge elements and fragments.

Q

Qualitative Reasoning: A reasoning method which is based on qualitative relations. Example: *Background Knowledge:* “All **attractive** products, while **priced slightly high**, will **sell well**.” *Premise:* “The present product is **very attractive** and **priced slightly high**.” *Conclusion:* “The present product will **sell very well**.”

Quick win: An initiative or a solution that yields rapid positive results.

R

Records Management: Every organization creates records, whether in paper, film, electronic record, or some other format. Records management helps an organization to make sure it is creating and maintaining an adequate documentary record of its functions, policies, decisions, procedures, and essential transactions. It then helps the organization to decide which ones to keep and which ones to destroy and how best to organize them all. Hence it involves processes relating to the generation, receipt, processing, storage, retrieval, distribution, usage and retirement of an organization's records.

Reference Methodology Knowledge: Knowledge of how to proceed with particular activities -- what to do next. Reference methodology knowledge is often possessed in the form of procedural knowledge and is used to govern planning as well as real-life actions at the time of execution.

Reference Models: See Mental Reference Model and Mental Model.

Return on investment (ROI): An estimate of the financial benefit (the return) on money spent (the investment) on a particular initiative.

ROI: Abbreviation for Return on Investment.

Role of Knowledge Worker: The particular function that a knowledge worker may assume in the work situation. Examples include: passive observer, apprentice, professional team member, team leader. The role that is assumed to a large extent governs the knowledge worker's behavior and contribution.

Routine Working Knowledge: See Automatic Knowledge.

Routine: A regular, often *unvarying procedure* for what to expect and how to handle a *specific kind of situation*. A routine is detailed, concrete, and inflexible. It consists of numerous and relatively deterministic, rigid steps which might cover many of the tasks in the process. Other tasks may still require explicit reasoning (they are still part of the script that underlies the routine).

Rule: See "Production Rule."

Rule-Based Knowledge-Based Systems: A type of knowledge-based system where the domain knowledge is represented in the form of production rules.

S

Schema Knowledge: Abstract and generalized knowledge which provides understanding of underlying principles and generic attributes of complex domains..

Schema: A broad and conceptual *plan or scheme* for a *class of situations*. A schema is a generalized concept which defines our understanding of the underlying structure, nature, or principles of a general type of story, situation, or "system." Schemata are concepts or mental models by which a static or dynamic situation can be characterized and understood. Schemata are typically abstract models of a generalized situation. Scripts -- often several -- are more concrete and specific than schemata and can be generated from schemas to form more definite expectations for evolutions of specific situations. It is a generalized concept which defines our understanding of the underlying structure, nature, or principles of a general type of story, situation, or "system. A spatially and/or temporarily organized structure in which the parts are connected on the basis of contiguities that have been experienced in space or time. A schema is formed on the basis of past experience with objects, scenes, or events and consists of a set of (usually nonconscious) expectations about what things look like and/or the order in which they occur. The parts, or units, of a schema consists of a set of variables, or slots, which can be filled, or instantiated, in any given instance by values that have greater or lesser degrees of probability of occurrence attached to them. Schema vary greatly in their degree of generality -- the more general the schema, the less specified, or the less predictable, are the values that satisfy them." (Adapted from Mandler, 1979, p. 263)

Script: A *general event sequence* which underlies a *referenced type of situation*. Scripts are flexible, somewhat abstract, and include general expectations and directions. Typically, scripts consist of several steps made up of episodes and events. Scripts are similar to, but more general than operational models and routines. The main difference is that scripts and their steps are general, broad, and flexible compared to the routines' specific and unvarying steps. Accordingly, hiring scripts, for example, may cover a range of positions -- not

only competent professionals as covered by a routine. *Technologically*: A technique for representing knowledge that stores in a series of “slots” the events and expectations for situations that evolve over time.

Search engine: A piece of software that carries out searches for information.

Semantic Network: A graphic knowledge representation method for representing associations between mental objects using a network of nodes with arcs between the nodes. The nodes represent mental objects (such as concepts or events), the arcs represent the relations between the objects. Semantic networks are related to concept hierarchies and knowledge maps.

Server: A computer that shares resources with other computers on a network.

Silo: An individual group within an organization, such as a department or unit. The term is often used to suggest that such groups tend to be inward-looking, in that they do not take into account what other similar groups are doing or how their work affects other such groups.

Single-Loop Learning (or: Adaptive learning): Single-loop learning involves using knowledge to solve specific problems based on existing assumptions, and often based on what has worked in the past. In contrast, Double-Loop Learning goes a step further and questions existing assumptions in order to create new insights. For example, take the problem 'how do we prevent earthquakes from killing people?'. The single-loop answer would be to learn how earthquakes happen and try to predict them in order to be prepared. The double-loop answer would question our notion of 'earthquake' and might conclude that earthquakes do not kill people, falling buildings do. Organizational learning occurs when errors are detected and corrected and firms carry on with their present policies and goals. According to Dodgson in 1993, SLL can be equated to activities that add to the knowledge-base or firm-specific competencies or routines without altering the fundamental nature of the organization's activities. (Argyris and Schön 1978.) (Also, see double loop learning).

Situational Awareness: Situational Awareness is the functional proficiency by which a person is aware and makes sense of a situation. Any time a person encounters a situation, she observes it by obtaining, decoding, analyzing, interpreting and accepting information about it.

Socialization: The process of sharing tacit knowledge by bringing people together to discuss things, share experiences or work together.

Speech Recognition: Techniques which allow computers to recognize words and phrases of human speech.

Speech Synthesis: Techniques which allow speech generation by a computer.

Storytelling: The use of stories in organizations as a way of sharing knowledge and helping learning. Stories can be very powerful communication tools, and may be used to describe complicated issues, explain events, communicate lessons learned, or bring about cultural change.

Structural Capital: Structural capital is part of Intellectual Capital and includes all of the enterprise's intellectual property and intellectual property rights. It includes factors such as technology, practices, organizational structure, patents, copyrights, and so on. It includes an organization's “captured knowledge” such as best practices, processes, information systems, databases etc. Often described as the knowledge that remains in the organization “after the employees have gone home for the night”.

Symbolic Processing: Symbolic processing is the basis of AI programming. It uses computers to manipulate symbols, in contrast to conventional numeric processing.

Symbolic Reasoning: The use of symbolic processing to solve reasoning problems using strategies and heuristics to manipulate the symbols.

System: A group of objects which interact partially or completely with each other.

Systematic Knowledge: The next highest abstraction level of conceptual knowledge at which we hold *System*, *Schema*, and *Reference Methodology Knowledge*. Our knowledge of underlying systems, general principles, and problem-solving strategies is, to a large extent, explicit and mostly well known to us.

Systems Theory: The transdisciplinary study of the abstract organization of phenomena, independent of their substance, type, or spatial or temporal scale of existence. It investigates both the principles common to all

complex entities, and the (usually mathematical) models which can be used to describe them. (Heylighen and Joslyn 1992)

Systems Thinking: Systems thinking refers to a broad and comprehensive perspective of how components of larger entities (systems) work together and how their activities need to be coordinated to facilitate effective and smooth operation without conflicts and inefficiencies. Systems thinking embraces concepts for projecting implications of changes and behaviors of dynamic situations where many parallel activities are coupled and affect each other in complex, often nonlinear, ways. (Does not refer to “information systems.”)

T

Tacit Knowledge: Knowledge that a person possesses unconsciously. Tacit knowledge may be inaccessible to conscious recall and reasoning because it: (a) Is not well understood; or (b) Is highly routinized and automatic and has transgressed the recall barrier. The knowledge or know-how that people carry in their heads. Compared with Explicit Knowledge, tacit knowledge is more difficult to articulate or write down and so it tends to be shared between people through discussion, stories and personal interactions. It includes skills, experiences, insight, intuition and judgment. Note: Some authors draw a distinction between tacit and implicit knowledge, defining tacit knowledge as that which cannot be written down, and implicit knowledge as that which can be written down but has not been written down yet. In this context, explicit knowledge is defined as that which has already been written down.

Talk-Aloud: Narrative produced by a person while performing an activity to reflect aspects under consideration at the time. Is related to “Think-Aloud” which is narrative that reflects thoughts and reasoning of a person while undertaking a Knowledge-Intensive (K-I) activity. “Verbal Protocol” is the talk-aloud narrative produced by knowledge workers while undertaking K-I tasks.

Task Environment Analysis (TEA): Detailed knowledge-focused TEAs consist of in-depth investigations of how knowledge workers perform business tasks and the conditions under which they work. The focus is on **knowledge**, its manifestations, presence, use, etc., and how important knowledge is, given the environment’s driving forces. Its focus is on how the task is performed, what its inputs are, what its deliverables are and, to some extent, how they are used by “customers.” Most TEAs also take the next step of considering how deliverables may be used as business and operating practices change, and how the task may be modified and strengthened by changing its organization or operation or by introducing different perspectives or different support systems.

Taxonomy: A hierarchical structure used for categorizing a body of information or knowledge, allowing an understanding of how that body of knowledge can be broken down into parts, and how its various parts relate to each other. Taxonomies are used to organize information in systems, therefore helping users to find it.

Text Understanding: The area of natural language understanding which allows computers to recognize the content of written text.

Thesaurus: An organized language, used for inputting and searching information systems, which predefines the relationships between terms and concepts used in its vocabulary.

Think-Aloud: Narrative which reflects the thoughts and reasoning of a person while undertaking a K-I activity.

Thinking about Thinking: Being consciously able to engage in meta-reasoning and understand mental processes such as strategies and models.

Upstream Function: A function which supplies the target function with work products.

User Interface: The facility of a knowledge-based system which supports bidirectional communication between the system and its user. Most user interfaces use natural language-processing techniques and bit-mapped graphics.

V

Verbal Protocol: Talk-Aloud narrative produced by knowledge workers while undertaking Knowledge-Intensive (K-I) tasks.

Virtual (Virtual team): 'Virtual' is a term used to describe something that exists or is brought together via

electronic networks, rather than existing in a single physical place. For example, a 'virtual team' is a team whose members are not located together and who utilize electronic networks for communication, collaboration and work processes.

W

Web browser: A software program that resides on your computer enabling you to access the Internet and view World Wide Web (www) pages and documents. Netscape and Internet Explorer are examples of web browsers.

White pages: In knowledge management terms a white pages is a structured directory of people within an organization, usually in electronic form. It is often the basis for an Expertise Directory or Knowledge Inventory System.

Work Role: The often complex role that a knowledge worker is given or takes on. The role reflects the passive-active and learner-teacher behavior. Examples are: Expert and team leader; Apprentice and project assistance; Quality controller.

Work-Domain Knowledge: (Also Domain Knowledge) Knowledge that pertains directly to performing primary work such as a design engineer's engineering knowledge, knowledge of systems and procedures for performing design work, etc.

World Wide Web: The terms the "Internet" and the "web" are often used interchangeably, however the World Wide Web is actually a collection web pages that can be accessed on the internet. The web has become the most popular area on the internet because everyone can view the pages regardless of what kind of computer they are using.

X

XML: Abbreviation for eXtensible Markup Language. A successor technology to the markup language HTML that is used for creating web pages and documents.