Glossary

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Monograph: Double Helix

This glossary was prepared under the guidance of Hans-Erik Nissen in collaboration with the authors of the papers in the monograph. It is a glossary of terms used in monograph **Double Helix relationships in use and design of Informing Systems: Lessons to learn from phenomenology and hermeneutics**

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The papers below, together with the editorial, are supported by this glossary:

- **Double Helix relationships in use and design of Informing Systems: Lessons to learn from phenomenology and hermeneutics.** (Editorial paper) by Hans-Erik Nissen, Peter M. Bednar and Christine Welch.
- **'Using Double Helix Relationships to Understand and Change Informing Systems'** by Hans-Erik Nissen.
- **'Applying Phenomenology and Hermeneutics in IS Design: A Report on Field Experiences'.** by Randall Whitaker.
- **'Pedagogy and Process in "Organisational Problem-Solving"'.** by John P. Kawalek
- **'Co-evolution and Contradiction: A Diamond Model of Designer-User Interaction.'** by Anja-Karina Pahl and Linda B. Newnes.

- **'The Culture of Information Systems in Knowledge-Creating Contexts: The Role of User-Centred Design.'** by Natalie Pang and Don Schauder.
- **'On Categorizing the IS Research literature from a User Perspective'.** by Bandula. Jayatilaka, Heinz. K. Klein and J. Lee.
- **'A double helix metaphor for use and usefulness in Informing Systems'.** by Peter M. Bednar and Christine Welch.

Glossary

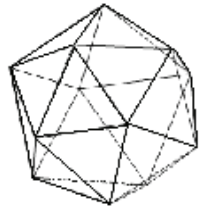
Boldface terms in an explanation or note are terms explained elsewhere in the glossary.

Term	*Explanation*	*Note*
1PP	Acronym for **first person perspective**.	Originated in the software gaming community.
3PP	Acronym for **third person perspective**.	Originated in the software gaming community.
actor	The term 'actor' is used to denote any individual human being who takes part in a **human activity system**. In the text the term is generally used to refer to an individual human being in the real world. This is a somewhat broader use than the one in the first sentence connecting the term with a human activity system according to Checkland (1981).	
Cf. or cf.	Abbreviation of the Latin word "confer". The imperative of *conferre*: to compare. Meaning: Compare!	

Term	Explanation	Note
commons, historical	Historically land used in common by people of a community esp. for pasture.	Cf. **knowledge commons**.
connotational	Indicates that a word or phrase suggests or implies a meaning along with or apart from the thing named. Also used to describe one function of natural languages.	Cf. **denotational.**
constructivism	An epistemological orientation emphasizing the subjectivity of knowledge and the observer's active role in generating knowledge from experience.	Cf. **radical constructivism.**
cybernetics	The study of communication and control. It typically involves regulatory feedback in living organisms, machines and organizations, as well as their combinations.	Ashby (1956), Wiener (1948).
data	The term "data" is often used in everyday language as a synonym of "information". In the context of information systems research (ISR) the term "data" should be delimited to denote "means for presenting information" or "digital or alphabetic symbols presenting part of a message". In order to inform data need to be interpreted by an observer, who relates them to his pre-knowledge. Sometimes the term "data" is used to refer to what in a court trial would be called "not contested evidence". The fact that data are not given but somehow selected has been stressed by Checkland and Holwell (1998, pp. 86 – 92). To indicate this they suggest using the term "capta".	Data is the plural form of the Latin word "datum". Langefors (1993, pp. 147-150) gives an argument why it is important to distinguish "data" from "information" in ISR. Strictly speaking computers only process data. Cf. **information**.

Term	Explanation	Note
denotational	Indicates the direct specific reference of a word as distinct from any additional suggestions. Also used to describe one function of natural languages.	Cf. **connotational.**
diachronic	Considering phenomena as they occur, or develop over time.	Cf. **synchronic.**
DNA	An abbreviation of Deoxyribonucleic acid a nucleic acid containing genetic instructions for the development and functioning of living organisms.	
duality of structure	Structure as the medium and outcome of the conduct it recursively organizes; the structural properties of **social systems** do not exist outside of action but are chronically implicated in its production and reproduction.	According to Giddens (1984, p. 374).
enact	In simplest terms, used for "act" to stress the involvement of the actor's body.	Varela, et al. (1991, pp. 172 – 179).
epistemology	The philosophical field concerned with knowledge – its nature, the mechanisms underlying its accretion and manipulation, its limits, its validity, etc.	The term is sometimes used to connote the specific knowledge of a given person.
ERP	Acronym for: Enterprise Resource Planning. ERP systems attempt to integrate all data and processes of an organization into a unified system. An ERP system uses many components of computer software to achieve the integration.	
et al or et al.	and others	Latin et alia.
ex ante	Based on assumption and prediction; being essentially subjective and estimative.	Latin cf. **ex post.**

Term	Explanation	Note
experience(s)	Experience refers to a high level of abstraction. Human experience develops as part of living. Experiences refer to a lower level of abstraction. Experiences, or rather descriptions of experienced episodes, are episodes reflected **ex post**.	
ex post	Based on knowledge and retrospection; essentially experience based.	Latin. cf. **ex ante**.
extensional	The truth value of a sentence, in an extensional language, only depends on if the subject belongs to the set explicitly defined by the predicate.	Cf. **intentional.** Nissen (in this monograph).
first person perspective	The point of view or vantage of a given observer himself or herself.	Whitaker (in this monograph).
first order predicate logic	(Also called "first order predicate calculus.) A **logic** strong enough to deal with sentence forms and not only with propositions. A sentence form has no definite truth value because of the appearance of individual variables. A sentence form qualified by a quantifier, such as some, all, or there exists, takes on a truth value. In first order logic variables only range over sets of individuals. Predicates, describing properties and relations on sets, are treated as constants.	See, e.g. Korfhage (1966, chapter 6). Nissen (in this monograph).
HD	Abbreviation for a set of hermeneutic-dialectic schools of **metascience** mainly developed in Central Europe. Also called Continental schools of **metascience**.	See Radnitzky (1970).

Term	Explanation	Note
hermeneutics	Hermeneutics may be described as the development and study of theories of the interpretation and understanding of texts. The concept of "text" is here also extended beyond written documents to any objects subject to interpretation. Somewhat simplified hermeneutics addresses issues of interpretation and interpretable phenomena.	Earlier hermeneutics only referred to study of the interpretation of Biblical texts. There exist a number of schools of hermeneutics.
human activity system	A notional *purposive* system which expresses some *purposeful* human activity, activity which could in principle be found in the real world.	Checkland (1981, p. 314).
ibid. or ibid	In the same place.	An abbreviation of the Latin word "ibidem".
icosahedron	A convex polyhedron having 20 faces, 12 vertices, and 30 edges. All the faces are equilateral triangles. 	Mentioned in Pahl and Newnes (in this monograph). Beer (1994, p. 14).
i.e.	that is.	An abbreviation of Latin: id est.
implementation	In the context of computerized parts of informing systems it sometimes refers to introducing a new or changed such system in a work situation of an enterprise. Some authors delimit it to refer to coding the specifications for a computer program.	

Term	Explanation	Note
information	A frequently used, but easily misleading, noun. It makes the hearer/reader look for some (non existent) thing or substance. The word can hardly be avoided in expressions like "information system". It could help to stress that such an expression as "information system" is a non-separable unit.	Try to use verbs like "inform" or "orient". These help looking for the processes and relations involved in informing oneself or others.
information society	A model of society, which focuses on producing symbolic goods more than on producing material goods or even services. By focusing on production the concept gets a technical bias. Human societies are developed by people based on what they historically received from their ancestors to be handed over to new generations.	Cf. the explication of **WSIS**.
informing system	A socio-technical **organization (M&V)** intended to inform or orient oneself or other clientele.	
innovation	An orientation to improvements focusing on novel features (e.g., form, functionality) of an artifact.	As used by Whitaker (in this monograph).
intentional	To decide the truth value of a sentence in intentional language, used in natural language and in social sciences, one must understand it.	Cf. **extensional.** Nissen (in this monograph).
intervention	An orientation to improvements focusing on modifications to any aspect(s) of a joint human-machine system.	As used by Whitaker (in this monograph).

Term	*Explanation*	*Note*
ITU	International Telecommunication Unity. Today a United Nations agency.	Mentioned in Pang and Schauder (in this monograph) as UN/ITU.
knowledge	A frequently used, but often misleading, noun. It easily makes the hearer/reader look for some (non existent) thing or substance. Preferably verbs should be used to indicate what persons know or show they can do practically.	
knowledge commons	Historically "commons" was used about land used in common by people of a community. Lately, the term "knowledge commons" has become applied to cultural institutions and the creation of intellectual property. Libraries may now refer to themselves as sites of shared and available resources and places where collaborative work happens.	In Pang and Schauder (in this monograph), who also have contributed to this explanation. Cf. **commons, historical**.
languaging	Therefore to operate in language is not an abstract activity, as we usually think. Language takes place in the domain of relations in the recursion of consensual coordinations ..., but at the same time language takes place through structural interactions in the domain of the bodyhoods of the languaging organisms.	From Maturana (1988, pp. 31-32).
LE	Abbreviation for a set of logical-empirical schools of **metascience** mainly developed in The U.K. and the U.S.A. Also called Anglo-Saxon schools of **metascience**.	See Radnitzky (1970).

Term	Explanation	Note
logic	Often simply understood as two-valued logic formalized in propositional and in **first order predicate logic**. However, there exist a number of other logics, e.g. many valued ones. Moreover, the logic of a description is the same as the logic of the describing system. Not all describing systems apply the same logic.	On logics see Haack (1978). Maturana and Varela (1980, p. 52).
Mahayana Buddhism	Mahayana (Sanskrt). Maha great, Yana way or vehicle. This style of Buddhism is based on the second cycle of teachings given by the historical Buddha Shakyamuni. It goes beyond the first cycle teachings (on the recognition and release of one's own suffering), to identify the nature of being in the world with others. While enlightenment is the future goal, the means of becoming a Buddha and transcending self is by helping others. Thus the path focuses on compassion as an activity of merit and wisdom as being the other hand of enlightened activity. This path is often followed by lay people.	Mentioned in Pahl and Newnes (in this monograph). Explanation given by Pahl in a personnel communication.

Term	Explanation	Note
metascience	Metascience studies scientific enterprises. These studies include: (a) studies of researchers their motivation, abilities, ideas, etc. both individually and of members of a group or a school of some discipline; (b) studies of production (research) (How is research planned? How is research steered by research strategy? How are hypotheses framed? How are claims to knowledge supported?); (c) studies of products (How is knowledge systematized? How are knowledge systems improved?); (d) studies of reporting knowledge, i.e. the manner in which the results are made known to the scientific community and to society at large.	Radnitzky (1970, Vol. I, pp. 2-6). Referred to in Nissen (in this monograph).
M&V	Abbreviation sometimes used in this Glossary to refer to Maturana and Varela (1980).	
mutatis mutandis	With necessary changes having been made.	Latin.
noumena	An objective aspect of elements of the external world (as contrasted with an observer's subjective perception or apprehension of it).	Whitaker (in this monograph).
observer	Living human beings interact with each others and with things in their environment. In a sense this makes human beings both observers and interactors. Observation entails interaction. In the texts in the series interactors are generally simply called **actors**.	Cf. also Maturana and Varela (1980, pp. 32-33 and 98-99).

Term	Explanation	Note
octahedron	A convex polyhedron having 8 faces, 6 vertices, and 12 edges. All the faces are equilateral triangles. 	Mentioned in Pahl and Newnes (in this monograph). Beer (1994, p. 14).
ontogeny	The (biological) development or course of development of an individual.	Cf. **phylogeny.**
ontological	Relating to existence; especially based upon analysis of the nature of being.	
OODA	'Observe – Orient – Decide – Act'. A 4-step activity cycle model originated by Colonel John Boyd.	Referred to by Whitaker (in this monograph).
organization	The relations that define a system as a **unity**, and determine the dynamics of interaction and transformation which it may undergo as such a **unity**, constitute the organization of the system.	According to Maturana and Varela (1980, p. 137), cf. **structure** (different structures can realize the same organization).
orientee	A person receiving messages, who, unlike what is generally assumed of a receiver according to information theory, can interpret these independently of what their sender intends them to mean.	See Maturana and Varela (1980, pp. 28-33). Nissen (in this monograph).
orienter	A person sending messages, who intends to orient receivers by them, but does not control the interpretations of the receivers.	See Maturana and Varela (1980, pp. 27-33). Nissen (in this monograph).

Term	Explanation	Note
PC/I threshold	Abbreviation for Personal Computing/Internet threshold, necessitating the development of user-centric concepts alongside more established techno-centric approaches.	According to Pang and Schauder (in this monograph).
per se	by, of, or in itself.	Latin.
phenomenological	Of, pertaining to, or qualified with respect to an observer's subjective experience or cognitive processes.	
phenomenology	Phenomenology is the study of structures of consciousness as experienced from the **first person perspective**. It generally focuses on everyday life experience. The central structure of an experience is its intentionality, its being directed toward something. Somewhat simplified phenomenology focuses attention on perceived everyday life experience	There exist a number of schools of phenomenology.
phenomenon	An observable fact or event as it is observed or apprehended by an observer: an item of experience or perceived reality.	Epistemologists reserve this term for "an object of sense perception as distinguished from an ultimate reality".
phylogeny	The evolution of a genetically related group of organisms.	Cf. **ontogeny.**
praxial	Of or pertaining to praxis.	Adjectival form coined by Whitaker.
praxio-focal	An orientation or approach framed with regard to a particular person's or role's praxis in a work or action context.	Adjectival form coined by Whitaker.

Term	Explanation	Note
praxis	Action, which can be efficient or inefficient. In the writings of Marx "praxis" particularly denotes action, which transforms economic circumstances to free man from his alienation (in a capitalist society).	Aristotle, in his conception of three basic activities of man: theoria, poiesis and praxis made a distinction between good (*eupraxia*) and bad (*dyspraxia*) praxis.
protocol	A "way of working" [in a meeting or some other group process] can be called a protocol. At the same time "a protocol" also can refer to the text which contains the subject-matter of a meeting. Both these explanations are helpful, as long as they include human behavior.	Beer (1994, pp. 19 - 20). Pahl and Newnes (in this monograph) present a **team syntegrity** protocol for 10-12 people.
radical constructivism	A way of knowing and learning based on the principles: • knowledge is not passively received but built up by the cognizing subject; • the function of cognition is adaptive and serves the organization of the experiential world, not the discovery of **ontological** reality. (p. 18, boldface added here.)	von Glasersfeld (1995).
second-order cybernetics	An extension of **cybernetics** theory largely focused on cybernetics with an awareness that the observers/investigators are part of the system, and of the importance of self-referentiality, self-organizing, etc.	Whitaker (in this monograph) and Heinz von Foerster (1981).

Term	Explanation	Note
semiotic	To interpret signs as in semiotics, a philosophical theory of signs and symbols that deals especially with their function in both artificially constructed and natural languages.	Whitaker (in this monograph).
SHK	Sang Hyang Kamahayanikan: ancient **Mahayana** Buddhist texts.	In Pahl and Newnes (in this monograph).
social system	The pattering of social relations across time-space, understood as reproduced practices. Social systems should be regarded as widely variable in terms of the degree of 'systemness' they display and rarely have the sort of internal unity which may be found in physical and biological systems.	According to Giddens (1984, p. 377).
status quo	The existing state of affairs as in political or social relationships.	Latin.
structuration	The cumulative effect of people's living and working within social frameworks (through a dynamics that Giddens calls struturation) is the production and re-production of culture. The cultural context is continuously generated and re-generated through the interplay of action and structure (the '**duality of structure**'). Social structure both supports and constrains the endeavors of individuals, communities, and societies. (Giddens, 1984, pp. 1-40.) In essence, structuration theory holds that "man actively shapes the world he lives in at the same time as it shapes him" (Giddens, 1982, p. 21)."The structuring of social relations across time and space, in virtue of the **duality of structure**". (Giddens, 1984, p. 377. boldface added here.)	The explicatory text before the excerpt from Giddens' (1984, p. 377) glossary has been contributed by Pang and Schauder. Giddens' theory of structuration plays an important role both in the papers of Jayatilaka, Klein, Lee and of Pang and Schauder.

Term	Explanation	Note
structure	Rules and resources, recursively implicated in the reproduction of **social system**s. Structure exists only as memory traces, the organic basis of human knowledgeability, and as instantiated in action. (Boldface added here.)	According to Giddens (1984, p. 377).
structure	The actual relations which hold between the components which integrate a concrete machine in a given space.	According to Maturana and Varela (1980, p. 138) cf. **organiztion.**
structures	Rule-resource sets, implicated in the institutional articulation of **social system**s. To study structures, including structural principles, is to study major aspects of the transformation/mediation relations which influence social and system integration. (Boldface added here.)	According to Giddens (1984, p. 377).
synchronic	Concerned with events existing in a limited time period (as the present) and ignoring history.	Cf. **diachronic.**
syntegrity	A word drawn together from the words "synergistic **tensegrity**". A term coined to refer to group processes in a group exhibiting logical closure. Such a group looks for the compression of its shared idea into a cohesive statement. It is also aware of tension. Tension generates discussion not to say argument. It is an exemplar of a Fullerian **tensegrity** balance.	Beer (1994, pp. 12 - 14).

Term	Explanation	Note
system	A system is not something given in nature but something defined by intelligence. ... We select from an infinite number of relations between things, a set which, because of coherence and pattern and purpose, permits an interpretation of what might otherwise be a meaningless cavalcade of arbitrary events. It follows that the detection of system in the world outside ourselves is a subjective matter. Two people will not necessarily agree on the existence, or nature, or boundaries of any system so detected.	Beer (1966, pp. 242-243).
	A model of a whole entity; when applied to human activity, the model is characterized fundamentally in terms of *hierarchical* structure, *emergent properties*, *communication* and *control*. ... When applied to natural or man-made entities, the crucial characteristic is the *emergent properties* of the whole.	Checkland (1981, pp. 317-318).
system	Some authors use the term "system" both for models describing the **organization** of whole entities and for a **structure** (Maturana and Varela, 1980) implementing a particular **organization**. The reader has to be attentive to distinguish which they refer to from the context.	Cf. **social system**.

Term	Explanation	Note
team syntegrity	Team **syntegrity** is a group process which facilitates team building, innovation and planning. The process is designed to be non-hierarchical so that communication can be open and synergy can be captured. Team syntegrity Beer (1994) used for a **protocol** he developed to provide a structure for a group of thirty persons to join together in a non-hierarchical but interconnected exercise in creativity and the building of group consciousness.	Presented in Beer (1994) and in Leonard (1997). Used in Pahl and Newnes (in this monograph).
tensegrity	A crucial aspect of the concept of **syntegrity**, means tensile integrity (where "tensile" refers to both tension and compression), and refers to arrangements (called a **protocol**) for conducting proceedings within [a] group to maintain its productivity and creativity. (A term coined by W. Buckminster Fuller from "tensile integrity" characteristic of domes he built for tensile strength of their structure as a whole.)	Beer (1994. pp. 13, 21).
Theravada Buddhism	Theravada (Sanskrt). Thera Elder or monk, Yana way or vehicle. Also called Hinayana, where Hina is translated as 'basic'. This style of Buddhism is based on the first cycle of teachings given by the historical Buddha Shakyamuni. It identifies the basis of suffering and the existence of methods to liberate oneself from suffering and reach an 'unbound' state. The means of reaching liberation is formal meditation and analytic concentration, which usually take place in a monastic setting.	Mentioned in Pahl and Newnes (in this monograph). Explanation given by Pahl in a personnel communication.

Term	Explanation	Note
third person perspective	The point of view or vantage of an observer when observing another person.	Whitaker (in this monograph) and Dunne (1993, p. 5).
TRIZ	A Russian acronym for Altshuller's 'theory of inventive problem-solving'.	In Pahl's and Newnes' paper (in this monograph).
UCD	Abbreviation for User Centered Design. Although several definitions exist, they all agree on the same differentiation from prescriptive design.	In Pang and Schauder (in this monograph) their UCD focuses on human needs ahead of perceived technological imperatives.
unity	That which is distinguishable from a background, the sole condition necessary for existence in a certain domain. The nature of a unity and the domain in which a unity exists are specified by the process of its distinction and determination; this is so regardless of whether this process is conceptual or physical.	According to Maturana and Varela (1980, p. 138).

Term	Explanation	Note
Vajrayana Buddhism	Vajrayana (Sanskrt). Vajra diamond or thunderbolt, Yana way or vehicle. This style of Buddhism is based on the third cycle of teachings given by the historical Buddha Shakyamuni. Originally given only to a select group of disciples, it goes beyond second cycle teachings to define all beings as having Buddha Nature and the ability to reach enlightenment. The means of becoming a Buddha is by helping others, but in addition to the utilizing the qualities and activities of Mahayana Buddhism, special techniques are added. These significantly reduce the time needed to achieve results, as they weave and mirror Enlightenment into the present day. The path is generally followed by yogis or those who do not belong to any one social group.	Mentioned in Pahl and Newnes (in this monograph). Explanation given by Pahl in a personnel communication.
von Neumann architecture	An architecture for universal computers comprising a control unit, an arithmetic/logic unit, a memory, an input/output unit, and a bus connecting all units.	Mentioned in Nissen (in this monograph).
von Neumann computer	A digital computer implementing a **von Neumann architecture**. In order to work a program has to be loaded into the computer.	Mentioned in Nissen (in this monograph).
WSIS	Abbreviation for World Summit on the **Information Society**. Initiated by the United Nations General Assembly on 21 December 2001, the organization of this conference is led by the International Telecommunication Union. It brings together representatives from the highest levels of government, businesses from the private sector, civil society, and nongovernmental organizations.	Mentioned in Pang and Schauder (in this monograph).

References

Ashby, W. R. (1956). *An introduction to cybernetics*. London: Methuen.

Beer, S. (1994). *Beyond dispute: The invention of team syntegrity*. Chichester: John Wiley & Sons.

Beer, S. (1966). *Decision & control: The meaning of operational research & management cybernetics*. Chichester: John Wiley & Sons.

Checkland, P. (1981). *Systems thinking, systems practice*. Chichester: John Wiley & Sons.

Checkland, P. & Holwell, S. (1998). *Information, systems and information systems – making sense of the field*. Chichester: John Wiley & Sons.

Giddens, A. (1982). *Profiles and critiques in social theory*. Berkeley: University of California Press.

Giddens, A. (1984). *The constitution of society*. Cambridge: Polity Press.

Haack, S. (1978). *Philosophy of logics*. Cambridge U.K.: Cambridge University Press.

Korfhage, R. R. (1966). *Logic and algorithms: With applications to the computer and information sciences*. New York: John Wiley & Sons.

Langefors, B. (1993). *Essays on infology: Summing up and planning for the future*. B. Dahlbom (Ed.). Gothenburg, Sweden: Department of Information Systems, University of Gothenburg. Report 5 (August 1993).

Leonard, A. L. (1997). *Team syntegrity background*. Retrieved February 18, 2007 from http://www.phrontis.com/facilts.htm

Maturana, H. R. (1988). Ontology of observing: The biological foundations of self consciousness and the physical domain of existence. In R. Donaldson (Ed.), Conference workbook *Texts in cybernetic theory: An in-depth exploration of the thought of Humberto Maturana, William T. Powers, and Ernst von Glasersfeld*". American Association for Cybernetics, 1988. Retrieved November 4, 2006, from http://www.inteco.cl/biology/ontology/index.html

Maturana, H., R. & Varela, F. J. (1980). *Autopoiesis and cognition: The realization of the living*. Dordrecht: D. Riedel. (First published in Chile 1972 under the title *De Machinas y Seres Vivos*.)

Radnitzky, G. (1970). *Contemporary schools of metascience* (Second revised edition). New York: Humanities Press and Gothenburg, Sweden: Akademiforlaget.

von Foerster, H. (1981). *Observing systems*. Seaside, CA: Intersystems Publications.

von Glasersfeld, E. (1995). *Radical constructivism*. Washington: Falmer Press.

Varela, F. J., Thompson, E. & Rosch, E. (1991). *The embodied mind: Cognitive science and human experience*. Cambridge, MA: MIT Press.

Wagner, H. R. (Ed.). (1970). *Alfred Schutz on phenomenology and social relations: Selected readings*. University of Chicago Press

Wiener, N. (1948). *Cybernetics or control and communication in the animal and the machine*. Cambridge, Mass.: MIT Press.