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FOR A KANTIAN FOUNDATION OF IS RESEARCH: PROPOSALS FOR AN EPISTEMOLOGICAL PLURALISM

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Abstract

If a tradition of Kantian philosophy and methodological pluralism exists in Information Systems (IS) research, little attention has been paid to the Kantian pluralism in epistemology. Indeed, Kant's Critique of Pure Reason not only solved centuries-old oppositions of the philosophy of science but was applied to the study of Man and implemented in the Theory of Interpretation of general hermeneutics. Unfortunately, this pluralism was not followed by Human Sciences at their origins. Nevertheless, some Human Sciences remained consistent with Kant and with the Theory of Interpretation : history and sociology of conflicts. These disciplines are used in IS, demonstrating that a pluralism is possible. The Kantian epistemological pluralism can be used in IS field research and can help in the classification of research methods in IS.

Introduction

Kantian philosophy and methodological pluralism seem to be represented by two parallel traditions in Information Systems (IS) research. The Kantian philosophical tradition in IS research is represented directly and indirectly. A direct Kantian tradition is represented from the beginning of *AMCIS Philosophical Foundation of IS* track by Ivanov (1984; 1996). And Churchman (1971). An indirect Kantian tradition is represented through the reference to Habermas, himself referring to Kant *Critique of Practical Reason* (1789) by Klein (1981), Klein and Lyytinen (1985) and Hirschheim, Klein, and Nissen (1991). On the other hand, methodological pluralism has been advocated by the IFIP 8.2 community (Fitzgerald, Hirschheim, Mumford and Wood-Harper 1985; Hirschheim 1985; Landry and Banville 1992; Robey 1996; Lee 1991; Lee 1999 a). Nevertheless, little attention has been paid on how a pluralism could be grounded not on the methodological level nor to reference of Kant's ethics described in the *Critique of Practical Reason* (1789), but on Kant's epistemology described in the *Critique of Pure Reason* (1781). This Kantian epistemological pluralism has been recognized by major epistemologists, physicists and philosophers (Popper 1972; Piaget 1967; Einstein 1987; Bohr 1963; Heisenberg 1962; Husserl 1936).

This paper advocates a Kantian epistemological pluralism in IS research. The origins of Kantian tradition in IS and in epistemology will be described in the first part. A second one will present the Kantian epistemological pluralism. A third part will describe the influence of this Kantian epistemology at the origins of the human sciences. In a fourth part, it will link it to the historical and sociological tradition in IS. Finally, proposals will be made for IS research.

The Origins of a Kantian Tradition in IS and Epistemology

The two parallel trends of Kantian tradition in the IS field seemed to have few contacts. Nevertheless, thinkers in epistemology, physics and philosophy recognize the importance of the *Critique of Pure Reason* for an epistemological pluralism.

The Origin of a Kantian Tradition in IS

Churchman (1971) opened an important discussion by presenting five *inquiring systems* (Leibniz, Locke, Singer, Hegel and Kant). Although he referred to the *Critique of Pure Reason*, his intent was not to ground a pluralism, but to show the implication for the

study of decision making in reference to Simon (1977). Then, Ivanov (1984) presented a broad view of philosophical schools of thought : between the two extremes of empiricism (Locke) and idealism (Leibniz), the two “unifications” may come either from Habermas (1984) or Karl-Otto Apel (1973). But Ivanov did not underline that each of these authors referred to Kant in order to propose a “unification”. The first “unification” has been developed by the use of Habermas’ Critical Theory by Klein (1981), Klein and Lyytinen (1985) and Hirschheim, Klein, and Lyytinen (1995), especially through the concepts of communicative and discursive action as opposed to instrumental and strategic action. In each case, the reference is Habermas *Communication and the evolution of society* (1979) and then *theory of communicative action* (1984). Habermas himself refers to Kant’s ethics, especially the *Critique of Practical Reason* (1789) for his theory of communication, but does not use Kant’s epistemology described in the *Critique of Pure Reason* (1781). Nevertheless, this reference is used in epistemology

Kantian Tradition in Epistemology

The definition of epistemology is subject to debate. The classical definition separates the study of knowledge (epistemology *per se*) from the study of scientific methods and results (philosophy of science) (Russel 1968; Popper 1972). In particular, for Popper (1972) epistemology deals with evaluation of the scientific results through the “falsification criteria”. For Piaget (1967) epistemology is the constitution of valuable results i.e. results that can be found by independants teams of researchers. But many scientists, like Einstein (1987) or Heisenberg (1962) criticized those definitions as normative. This opened the way for a definition of epistemology as the description of the effective evolution of sciences, and especially the radical upheavals of sciences, like those which happened in (quantum) Physics, (structural) Chemistry or (Goedel’s) Mathematics. This description can be discerned from the study of the historical condition of the evolution of knowledge (Foucault 1972) or through a radical analysis of the meanings of sciences (Husserl 1936). In that phenomenological approach, epistemology becomes the study of the “crisis of sciences” where “*scientificity criteria of all sciences must be submitted to a serious criticism*” (p. 9). But all these authors recognize the contribution of Kant’s *Critique of Pure Reason*. Indeed, that *Critique* allowed to overcome centuries-old oppositions in the history of the philosophy of science.

Kantian Epistemological Pluralism

Kant was able to overcome the two main oppositions in the philosophy of science and to ground an epistemological pluralism that he applied to the study of Man.

The Oppositions of the History of the Philosophy of Science

Two main debates are dividing the history of the philosophy of science. The first one is between empiricists and rationalists. The second one is between intellectualists and materialists. Those two debates are described in the *Critique of Pure Reason* (Kant 1781). The debate between empiricists and rationalists is about concepts. Where do concepts come from? Experience? Reason? The “empiricists” with Locke (and Hume) “*derive all concepts from experience*” (p. 773). On the contrary, the “rationalists”¹ with Leibniz (and Descartes) believed that the concepts only came from reason “*independently from experience*” (p. 772). The second debate between intellectualists and materialists is about the object of research. Is this object of research given by the five senses (“material”) ? Or is it purely intellectual? The first view was held by “materialists”² led by Epicurus, who “*granted intellectual concepts, but assumed only sensible objects*” (p. 772). This position was contradictory to the “intellectualists” led by Plato who “*required the true objects to be merely intelligible*” (p. 772). Kant was able to overcome these two oppositions of the history of the philosophy of science.

The Pluralism of the Critique of Pure Reason

Kant proposes the “*critical method*” based on the “*distinction of representations*” (p. 29). All objects must be considered simultaneously in “*two points of view*” (p. 23). The first point of view is “sensible”. It considers the object as a “phenomenon”,

¹Called « noologists » by Kant.

²Called “sensualists” by Kant.

as “*objects of experience*” (p. 28). The second point of view is “intellectual”. It consider the object as an “*object that we merely think*” (p. 23) because “*isolated reason strives to transcend all bounds of experience.*” (p. 23). These two points of view, sensible and intellectual, “phenomenon” and “object of thinking”, define an epistemological pluralism that reconcile materialists and intellectualist positions about the object of knowledge. It also allows to overcome the opposition between empiricists and rationalists about the origin of concepts. Indeed, “*Even though all our cognition start with experience, that does not mean that all of it arises from experience*” (p. 43). Indeed, there must be pre-defined categories³ that must exist in order to interpret experience. Especially, the categories of space and time for intuition, and logical functions for judgments that allow to “*arrange various representations under one common representation*” (p. 121). These categories are not given in the phenomenon, they are pure “object of thinking” given *a priori*, i.e. independent from experience (table 1).

Table 1. The Distinction of Representations in the Critique of Pure Reason

Representation	Phenomenon	Object of thinking
<i>Origin of concepts</i>	Experience	Reason
<i>Object of knowledge</i>	Sensible (“material”)	Intellectual

This principle has been successfully used in physics. Classical physics (Newton and Galileo) collapsed because it was unable to explain the behavior of a phenomenon that was between matter and energy. This phenomenon was light (Schrodinger 1935). Quantum physics explained it assuming that light was *either* energy (wave) *or* matter (corpuscle) *depending* on the means of observation. Nobel Prize, Neils Bohr (1963) named it the “principle of complementarity”, quoting explicitly Kant’s distinction of representations in the *Critique of Pure Reason* (Einstein 1987; Folse 1978). But this principle has also been applied to the study of Man by Kant himself.

The Epistemological Pluralism Applied to the Study of Man

Indeed, in order to illustrate the distinction of representations, Kant takes the example of Man. What happens if we do not use the distinction of representation in the case of Man’s will? Then, we study objects with only one standpoint. If man is a phenomenon, an object of experience, he is subject to the principle of causality, to Nature’s mechanism and, may be completely determined. Then, there is no difference between Nature and Humanity. Man is like all objects of Nature. This is the danger of empiricism and of sensualism (materialism) alone. But one thing characterizing Man is that he can use his free will. Otherwise, how can one justify art, science or morality? (Cassirer 1944). If I use only one deterministic standpoint, I cannot justify the difference between Humanity and Nature. Freedom cannot be thought with positivism alone (Lee 1999 b).

“*Suppose, on the other hand, that the Critique is not in error when it teaches to take objects in two different senses*” (Kant, *Critique of Pure Reason*, p. 29). On one hand, objects are considered as a phenomenon, as “sensible”, and as a consequence subject to physical laws and “*given to us in experience*” (p. 22). On the other hand, these *same* objects are “intellectual”, “*objects that we merely think*” (p. 23). Under this second aspect, they *cannot* be objects of experience. In that case, the principle of causality applies to things only in the *first* representation, as “sensible objects of experience”, but in the other representation, these *same* objects are *not* subject to experience. “*On these suppositions, no contradiction arises when we think the same will in both these ways : in its appearance, as conforming necessarily to natural law and as to that extent not free. Yet, on the other hand, as belonging to a an object of thinking, as not subject to that law, and hence as free*” (p. 29) “*I can still think freedom, if we make our critical distinction between the two representations*” (p. 29) because : “*freedom can absolutely not be object of experience*” (Kant, *Critique of Judgment*, p. 14).

But this illustration of the Critique of Pure Reason by the example of Man, indicating a way of an epistemological pluralism, was not followed by human sciences.

³Called « transcendental categories » or “*a priori cognitions*” by Kant.

Kant and the Origins of Human Sciences

While the human sciences appear to be divided at their origin, they reference to the general hermeneutics could have allowed a pluralism consistent with Kantian epistemology.

The Opposition Within Human Sciences

The Human Sciences are considered to find their origins in the book of Dilthey (1883) *Introduction to Mind Sciences*. Following Droysen’s book about History (1957), Dilthey defines Human Sciences as “sciences of comprehension” in opposition to “sciences of explanation”, i. e. Natural Sciences. This definition is in direct contradiction to another grounding of the human science called by Dilthey “the French sociologists” i.e. Comte and Durkheim. Indeed, the first rule of the sociological method recommended by Durkheim (1968) is to “considers social facts as things” (p. 15). This principle is clearly a application of natural sciences to social sciences or “natural sciences of social sciences” (Lee 1999 b). Comte (1995) argues that sociology should be able to know, in order to forecast and then guide action. Sociology must be based on explanation. This extreme position considers man as a phenomenon, as an object of experience, and neglects the difference between Nature and Humanity. (Table 2)

Table 2. Positivism and the Distinction of Representation

	Phenomenon	Object of thinking
<i>Positivism</i>	(1) natural sciences of social sciences” (Lee 1999 b) “considers social facts as things” (Durkheim)	(2) refuses to take into account the difference between Nature and Humanity

But on the other hand, the extreme position of human sciences as “sciences of comprehension” neglect the constraints that could help to explain some social actions as phenomenons (Table 3).

Table 3. Sciences of Comprehension and the Distinction of Representation

	Phenomenon	Object of thinking
<i>Sciences of comprehension</i>	(2) refuses to consider constraints of the context that could have and explanatory power like in history or sociology of conflicts	(1) focuses on comprehension and neglects explanation

The Origin of Human Sciences and Hermeneutics

Indeed, the definition of the “sciences of comprehension” by Dilthey (1883) and Droysen (1957) refers explicitly to the Theory of Interpretation, or *General Hermeneutics* of Schleiermacher (1810). The basic principle is that “understanding (a text) always involves two (interpretations): to understand what is said in the context of the language with its possibilities, and to understand it as a fact in the thinking of the speaker” (§ II.5). These two interpretations are called “grammatical” and “psychological”. The grammatical interpretation “considers the (text) as a product of language” (IX. 1). The psychological interpretation considers “how (the text), as a fact in the person’s mind, has emerged” (IX.2).⁴ This principle is consistent with the *Critique of Pure Reason* because it considers the same object, i. e. a text, with two points of view : as a phenomenon determined by the context, and as a object of thinking resulting from the freedom of the speaker. (Table 4).

⁴Note that neither the terms « subjective » or “objective” are used here even if Schleiermacher uses the term “subjective interpretation” for the “psychological interpretation”. To reduce the subjective dimension to the individual seem to be no more sustainable when there are so much “subjective” dimensions in the “context of language”. Indeed, there are maybe more fluid ad “subjective” dimensions in the grammatical context of a written or spoken text than in the thinking of the thinker. Even if Burrell and Morgan (1989) use the “subjective-objective” distinction, Deetz (1996) present a radical criticism of the term “subjective” in organizational science.

Table 4. Theory of Interpretation and the Distinction of Representation

	Phenomenon	Object of thinking
<i>Type of Interpretation</i>	Grammatical interpretation	Psychological interpretation
<i>Focus</i>	The context of the language	The thinking of the speaker

But Dilthey, and then Heidegger (1962) and Gadamer (1975; 1976) did not followed Kant’s *Critique of Pure Reason*, nor Schleiermacher’s Theory of Interpretation. They only focused on the comprehension of the author of a text, i.e. its intention to communicate, that is the “*psychological interpretation*”, forgetting the “*grammatical interpretation*” of the context. At their origin, human sciences missed the Kantian epistemological pluralism.

Historical and Sociological Traditions in IS

Nevertheless, pluralism is represented by at least two traditions in IS research, consistent with *the Critique of the Pure Reason* : historical tradition and sociological tradition.

The Historical Tradition in IS

Historical methods in IS are represented by Mason Mc Kenney and Copeland (1997), using Schumpeter (1954) and Jick (1979) methodology. On one hand, these approaches provide a description of the context : “*the organizational, individual, social, political and economic circumstances in which management IS phenomena occur*” (Mason *et al*, p. 308). But, on the other hand, they also undertake an “*empathy with the protagonists in the study*” (p. 316), the researcher must “*try to get at an understanding of (...) the meanings that the (actor) intends to attach to themselves and their behavior*”⁵ (Schumpeter, p. 819). A pluralistic point of view is therefore provided with historical methods. (Table 5)

Table 5. History and the Distinction of Representation

	Phenomenon	Object of thinking
<i>History</i>	Circumstances, context	Empathy, meaning

The Sociological Tradition in IS

Sociology of conflicts in IS is represented by Rose and Lewis (2001), using Giddens’ (1984) theory of structuration. Other sociological sources are used by Kvasny and Truex (2001), Mathiassen and Zullighoven (1984), Monod (1996) and Besson and Rowe (2001). Those sources are for instance Bourdieu (1991) or Crozier and Friedberg (1977). On one hand, these approaches describe the “*regularities of social practice*” (Rose and Lewis, 2001, p. 278) and the “*Relationships between involved actors and that are conditioning their strategies*” (Crozier and Friedberg, p. 452). Here “*grammatical interpretation*” gives way to “*contextual interpretation*”. But, on the other hand, sociology of conflicts also describe “*power relationship from the standpoint of the actor*” (p. 60) “*The reference to the “real life” of the actors is (...)the condition towards a serious knowledge of the field*” (p. 460) (Table 6).

⁵Once again, the terms « subjective » and « objective » are not used here. Indeed, one can argue that the social context of action as phenomenon as opposed to object of thinking ignores the purely subjective aspects of social interactions, beliefs, rules, standards and norms. Therefore, there is “*subjectivity*” in both the context and the actor. But the distinction of representation is purely epistemological, not ontological. The argument is that the context is simply *considered* as “*given by the senses*”, “*determined by laws*” (phenomenon) and, on the opposite the same object (action) is considered with another *research attitude* that focus on meanings. But this does not imply anything about the subjective or objective *nature* of the context or of the action.

Table 6. Sociology of Conflicts and the Distinction of Representation

	Phenomenon	Object of thinking
<i>Sociology of conflicts</i>	Regularities, conditioning relationships	Standpoint of the “real life” of the actor

Proposals for IS Research

Kantian epistemological pluralism can be used in IS field research and can help in classification of research methods in IS.

IS Field Research

First of all, IS definitions often swing between those which underly the human-computer systems producing informations in order to support operating and decision-making processes (Davis and Olson 1985, p. 6) and those which consider IS as “*Systems of social interaction aimed to create, exchange and interpret meanings*” (Hirschheim, Klein et Lyytinen, 1995, p. 13). The former consider IS as “*given to us in experience*” (Kant, 1781, p. 22) and determined by laws. The latter consider more IS as an “*object that we merely think*” (Kant, 1781, p. 23) (table 7).

Table 7. The Distinction of Representations Applied to Information Systems

	Phenomenon	Object of thinking
<i>Information System</i>	Hardware, software, processes	Social interactions, meanings

A classical IS field research is the organizational transformation through information technologies. The application of Kantian pluralism implies to consider the object with the distinction of representations. The action of organizational transformation is often depicted as resulting from management’s organizational strategy and IS design. The executive is portrayed as a rational actor choosing to design, manage and control change through the redesign of process and the implementation of information technology (Nadler and Tushman 1988, Hammer and Champy 1993). The action is here considered action the result of the willingness of the executive. It can be considered as an “object of thinking”, especially through the design of strategy and IS.

Nevertheless, this “psychological interpretation” can be completed by a “contextual interpretation”. Each of the actors including the executive can be considered determined by the influence of external forces. The actor is replaced by a wider context including the author’s role or social position and in which power is expressed through rules and norms (Foucault 1972). In this “contextual interpretation”, the characterization the author of the action with its subjectivity is replaced by “*an obscure set of anonymous rules.*” (p. 210). Action becomes a determined phenomenon.

But these two points of view can be held in the same time. In Agency Theory (Jensen and Mekling 1976) the behavior of a management as an organizational actor can only be understood by considering him as an “agent” serving on behalf of one external actor called the “primary”, e.g., the shareholder. In Stakeholder Agency Theory (Hills and Jones 1996) management remains an agent but now becomes one at the service of a larger set of stakeholders. Those stakeholders include shareholders, customers, employees, suppliers, and local communities. The “garbage can” theory of organizations presents each actor according to its role in the organization trying to impose its solution by inventing “problems” (Cohen, March and Olson 1972). Ultimately these actors seek to impose an organizational structure that best serves their own interests (Mintzberg 1979). The Sociology of Action (Touraine 1965) describes how the organizational action is a distancing from established norms and lead to organizational creativity. It can be considered as an “object of thinking”. But each of these actions is also directed towards the creation of new norms and new organizations. In this respects, action can be approached as a phenomenon.

Classifications of Research Methods in IS

The epistemological pluralism of Kant can also be used in order to ground classifications of research methods in IS. Four classifications are considered here : Galliers (1985), Nunamaker, Chen and Purdin (1991), March and Smith (1995) and Avison and Myers (2002).

Galliers (1985) compared the research approaches in IS. He argues for a more intensive use of “alternative approaches” i. e. phenomenological studies, hermeneutics, longitudinal studies and action research. Nevertheless, no references were made to Human Sciences, and to the way they use these “alternative approaches”. No indications were given on how to combine “scientific” and “alternative” approaches”. A Kantian epistemology could help in combining those two kind of “approaches” as we saw. Later, Nunamaker, Chen and Purdin (1991) considered system development as a “super-methodology” to be used in organization sciences. This “super-methodology” is described like empiricism. But How can a technical method be applied for the study of organizations? This would mean that organizations are only “phenomenon” and that there is no difference between Nature and Humanity. Another classification is March and Smith (1995). These authors consider that only two kinds of sciences exist : natural and design sciences. How is it possible to deny the existence of Human Sciences, or, at least, specificities of human action compared to natural phenomena? Finally, Avison and Myers (2002) argue that qualitative methods (action research, case study, ethnography), data collection and modes of analysis (hermeneutics and metaphor) can be used for each “philosophical perspective” i.e. positivism, interpretivism or Critical Social Theory. Unfortunately, the combination of qualitative and quantitative methods through “triangulation” (Jick 1979) is not considered by the authors. Here, the grounding of methodologies into an epistemological pluralism could help for the perspective of methods combination.

If Kant’s distinction of representations represents a way to combine⁶ positivism and interpretivism, it is not through the ontological dualism of two separate worlds : Nature and human societies (Dilthey, 1883), neither that some methods are only relevant to one domain, for instance nomothetic for Nature and ideographic for human societies (Windelband, 1915). This path is purely epistemological. Rather than a “dualism”, one should talk about a “pluralism”. But methodological pluralism as it is currently used in IS research present the threat of scattering (Robey 1996), and of relativism. This is why the term “complementarity” is often proposed to describe the two ways of approaching human societies. Even if their reference to Kant is mediated by the ethics of Habermas, the framework of Hirschheim, Klein and Lyytinen (1995) is in this sense complementarist because it use in front of the functionalist of IS narrative another narrative based on the Theory of Communicative Action. In order to connect this epistemology with the oppositions within history of philosophy of science, it means to be empiricist and materialist on one hand and on the other hand rationalist and intellectualist.

Conclusion

The pluralism in epistemology opened by the *Critique of Pure Reason* was not followed by Human Sciences at their origins despite the fact that they refer to the Theory of Interpretation of general hermeneutics. Nevertheless, epistemological pluralism is represented in IS research through historical methods and sociology of conflicts. These disciplines use the distinction of representation. They consider the object with two points of view: as a phenomenon and as an object of thinking. They make simultaneously a contextual interpretation and a psychological interpretation. In addition to historical methods and sociology of conflicts, Kantian epistemological pluralism can be used in IS field research. The example provided shows how to consider organizational action with the distinction of representation using the sociology of action, organizational structure theory and garbage can theory. This pluralism can also provide ideas for classification of research methods in IS.

Nevertheless, this research does not provide an integrated framework consistent with the classifications of research approaches in IS. An entire research program can be undertaken in order to compare more precisely the use of Kantian epistemology in each Human Science (Cassirer 1944; Apel 1973) and to make proposals for IS field (Monod 2002). A systematic comparison could also be made with hermeneutics. Indeed, in history as in sociology of conflicts, each actor is at the same time the producer and the product of history, just like in hermeneutic principle noticed by Klein and Myers (1999) that allows to start an “hermeneutic cycle” of interpretation.

⁶The word « combine » is used instead of « unify » because the latter could be understood as the Vienna Circle project of a “unified science », id est logical empiricism (Russel 1968).

References

- Apel, K.O. *Towards a Transformation of Philosophy*, Routledge and Kegan, London, 1973.
- Avison, D.A. and Myers, M. *Qualitative Research in Information Systems*, Sage, 2002.
- Besson, P. and Rowe, F. « ERP projects dynamics and enacted dialogue : perceived understanding, perceived leeway and the nature of task-related conflicts ». *Databases for Advances in Information Systems*, Vol. 32, n°4, 2001.
- Bohr, N. *Essays on atomic physics and Human Knowledge*, Interscience, New York, 1963.
- Bourdieu, P. *Language and Symbolic Power*, Cambridge, MA, Harvard University Press 1991.
- Burrell, G. et Morgan, G., *Sociological Paradigms and Organizational Analysis*, Heinemann, London, 1979.
- Cassirer, E. *An Essay On Man*, Boston 1944.
- Churchman, C. W. *The Design of Inquiring Systems : Basic Concepts of Systems and Organization*, Basic Books, Inc. Publishers, New York, 1971.
- Cohen, M. D. , March, J. G., et Olson, J. P. "A Garbage Can Model of Organizational Choice", *Administrative Science Quarterly* , Vol. 17, n°1, march, 1972, p. 1-25.
- Comte, A. *The positive philosophy*, Routledge, London, 1995.
- Crozier, M. and Friedberg, E. *Actors and Systems : the Politics of Collective Action* , Ginn and Co., Boston, 1977.
- Davis, G. B. et Olson, M. H. (1985), *Management information systems* , (2nd. Edition), Mc Graw-Hill ; New York.
- Dilthey, W. « Introduction aux sciences de l'esprit » in *Critique de la raison historique, tome I* :, Editions du Cerf, Paris, 1883, pp. 147-362.
- Droysen, J. G. *Outline of the Principles of History*, Ginn and Co, Boston, 1858.
- Durkheim, E. *Les règles de la méthode sociologique*, Presses Universitaires de France, Paris, 1968.
- Einstein, A. *The Collected Papers of Albert Einstein*, Princeton University Press, Princeton, 1987.
- Foucault, M. *The Archaeology of Knowledge*, Pantheon Books, New York, 1972.
- Fitzgerald, G., Hirschheim, R., Mumford E. and Wood-Harper, T. "Information Systems Research Methodology : an Introduction to the Debate" in Mumford, *et al. Research Methods in Information Systems : proceedings of the 1st IFIP 8.2 Conference*, Manchester, Elsevier Science Publisher, North-Holland, 1985, pp. 1-5.
- Folse, H. "Kantian aspects of complementarity». *Kant-Studien*, 69, 1978, pp. 58-66.
- Gadamer, H-G *Truth and Method*, The Continuing Publishing Corp., NY, 1975.
- Gadamer, H-G. *Philosophical Hermeneutics*, University of California Press, Berkeley, 1976.
- Galliers, R. D. "In search for a Paradigm for Information System Research", in Mumford, *et al. 1985 . Research Methods in Information Systems : proceedings of the 1st IFIP 8.2 Conference*, Manchester, Elsevier Science Publisher, North-Holland, 1985.
- Giddens, A. *The Constitution of Society : Outline of the Theory of Structure*, UCLA, Berkeley, 1984.
- Habermas; J. *The Theory of Communicative Action*, Beacon Press, Boston, 1984.
- Hammer, M. et Champy, J. (1993), *Reengineering the Corporation* , Harper Business, New York.
- Heidegger, M. *Being and Time*, State University of New York, 1962.
- Heisenberg, W. *Physics and Philosophy*, Penguin Science, New York, 1962.
- Hirschheim, R. "Information Systems Epistemology : an Historical Perspective». In Mumford, *et al. 1985 . Research Methods in Information Systems : proceedings of the 1st IFIP 8.2 Conference*, Manchester, Elsevier Science Publisher, North-Holland, 1985.
- Hills, C. and Jones, T. "Stakeholder-Agency Theory", *Journal of Management Studies*, vol. 29, n° 2, march, 1992, pp 131-153.
- Hirschheim, R., Klein, H. and Lyytinen, K. *Information Systems Development and Data Modeling : Conceptual and Philosophical Foundations*, Cambridge University Press 1995.
- Hirschheim, R., Klein, H. and Nissen, H.E. "A pluralist Perspective of the Information Systems Arena" in In Nissen, H.E., Klein, H. and Hirschheim, R. eds. *Information Systems Research : Contemporary Approaches and Emergent Traditions*, North-Holland, Amsterdam, 1991, pp. 1.18.
- Husserl, E. *The crisis of european sciences and transcendental phenomenology*, Northwestern University Studies in Phenomenology and Existential Philosophy, 1936.
- Ivanov, K. "Systemutveckling och adb-amets utveckling». Department of Computer Science Report LIU – 1 DA-R-84-1, Linköping University, Sweden, June, 1984.
- Ivanov, K. "Future Foundations of Inquiring Systems: Reformed Pragmatism or Spirituality?" *Philosophical Foundations of I.S.AMCIS*, Phoenix, 1996.
- Jensen, M. and Mekling, W. "Theory of the firm : managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, 3, 1976, pp. 305-360.
- Jick, T.D. « Mixing Qualitative and Quantitative Methods : Triangulation in Action ». *Administrative Sciences Quarterly* Vol. 24 n°4, 1979, pp. 602.611.

- Kant, E. *Critique of Pure Reason*, Hackett, Indianapolis / Cambridge, 1781.
- Kant, E. *Critique Practical Reason*, The Hafner Library of Classics, The Free Press, NY, 1789.
- Kant, E. *Critique of Judgment*, The Hafner Library of Classics, The Free Press, NY, 1790.
- Klein, H. K. "The design ideals and their Critical Reconstruction" ISRAM, DP- 81 05 2 1 , Faculty of Business, Mc Master University, Hamilton, Ontario, Canada, 1981.
- Klein, H.K. and Lyytinen K. J. "The critical theory of Jurgen Habermas as a basis for a theory of Information Systems" in Mumford et. al. *Research Methods in Information Systems*, IFIP 8.2, Elsevier Science Publishers, North-Holland, 1985.
- Klein, H. and Myers, M.« A Set of Principles for Conducting and Evaluating Interpretive Field Studies in I.S.» in *Management Information Systems Quartely* Vol. 1, n° 23, march, 1999, pp.67-94.
- Kuhn, T.S. *The Structure of Scientific Revolutions*, University of Chicago Press, Chicago, 1970.
- Kvasny, L. and Truex, D. "Defining Away the Digital Divide : a Content Analysis of Institutional Influences on Popular Representations of Technology" in Russo, N. Fitzgerald, B. and De Gross, J. *Realigning Research and Practice in I.S. Development* IFIP Kluwer, Boston, 2001.
- Landry, M. and Banville, C. "A Disciplined Methodological Pluralism for MIS Research" *Accounting, Management and Information Technology*, 2;2, 1992.
- Lee A. "Inaugural Editor's Comments" in *Management Information Systems Quartely* Vol. 1, n° 23, march, 1999 a, pp.v-xi
- Lee A. "Rigor and Relevance in MIS Research : Beyond the Approach of Positivism Alone" in *Management Information Systems Quartely* Vol. 1, n° 23, march 1999 b, pp.29-34.
- Lee, A. "Integrating Positivist and Interpretive Approaches to Organizational Research", *Organization Science*, 2, 4, 1991, pp. 342-365.
- March, S. T. and Smith, G. F. "Design and Natural Science Research on Information Technology». *Decision Support Systems*, Vol. 15, 1995, pp. 251.266.
- Mason, R. O. Mc Kenney J. L. and Copeland, D. G. « An Historical Method for MIS Research : Steps and Assumptions » in *Management Information Systems Quartely*, September, 1997.
- Mathiassen, L. and Zullighoven, H. *Approaches to Prototyping*, Springer-Verlag, Berlin, 1984.
- Monod, E. *Effectiveness of I.S. Development : the IBM France reengineering case* PhD dissertation, Ecole Nationale Supérieure des Télécommunications, Paris, 1996.
- Monod, E. « Epistemology of I.S. Research » In Rowe, F. Ed. *Doing Research in I.S. Faire de la recherche en systèmes d'information*, FNEGE, Dunod, Paris, 2002.
- Mintzberg, H. *The structuring of organizations : a synthesis of the research* , Englewood Cliffs, Prentice Hall, NJ, 1979.
- Nadler D. et Tushman, M. *Strategic Organization Design : Concepts, Tools, Process*, Scott, Foresman & Cy., 1988.
- Nissen, H-E, Klein, H. K. and Hirschheim, R. A. Eds . *Information Systems Research : contemporary Approaches and Emergent Traditions* North Holland, Amsterdam 1991.
- Nunamaker, J. F. Chen, M., and Purdin, T. D. M. "Systems Development in Information System Research" in *Journal of Management Information Systems*, vol. 7, n° 3, 1991, pp. 89-106.
- Piaget, J. *Principles of Genetic Epistemology* Hackett, Indianapolis / Cambridge, 1967.
- Popper, K.R. *The Logic of Scientific Discovery* , Hutchinson, London, 1972.
- Ricoeur, P. *Hermeneutics and the Human Sciences*, Cambridge, Cambridge University Press, 1981.
- Robey, D. "Research Commentary : Diversity in Information Systems Research : Threat, Promise and Responsibility" *Information Systems Research*, Vol. 7, n° 4, 1996, pp 400-408
- Rose, J. and Lewis, P. « Using Structuration Theory in Action Research : an Intranet Development Project ». In Russo, N. Fitzgerald, B. and De Gross, J. *Realigning Research and Practice in Information Systems Development : the Social and Organizational Perspective*, IFIP Kluwer Academic Publisher, Boston, 2001.
- Rudner, R. S. (1966), *The Philosophy of Social Science*, Englewood Cliffs, Prentice-Hall, New York.
- Russel, B. *History of Western Philosophy*, Hutchinson, London, 1968.
- Schrodinger, E. « The present situation in quantum mechanics » *Naturwissenschaften* Vol, 23, 1935.
- Schleiermacher, F. *Hermeneutics*, Ed. Heinz Kimmerle, MT, Scholar Press, 1810.
- Schumpeter, J. A. *History of Economic Analysis*, Oxford University Press, New York, 1954.
- Weber, M. *Essays on theory of science*, Hackett, Indianapolis / Cambridge, 1913.
- Windelband, W. *Geschichte und Naturwissenschaft in Praludien*, Tubigen, 1915.