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Abstract

In 1971 Churchman drew our attention to the importance of epistemology for information systems by modeling five types of 'inquiring' systems based on the evolving forms of epistemology. However, the evolution of epistemology did not end there. The most recent advance is the deliberative model. In this paper we clarify and strengthen the concept of deliberative communication as a form of deliberative inquiry and explain why it is an important topic for IS research.

Keywords: Epistemology of IS, Inquiring Systems, Deliberative Communication

> … our strength lies, in our opinion, not in deliberation and discussion, but that knowledge which is gained by discussion preparatory to action. For we have a peculiar power of thinking before we act, and of acting, too, whereas other men are courageous from ignorance but hesitate upon reflection.
>
> **Pericles' Funeral Oration (after 490 BCE) from Thucydides,**
> ***The Peloponnesian War***

Introduction

In the above quote from Pericles' Funeral Oration (after 490 BCE) in honor of those fallen in war, Thucydides highlights some of the qualities that supposedly distinguished Athens from its neighbors and contributed to its rise to power during its Golden Age between the Persian and Peloponnesian Wars (ending with Athens' surrender in 404 BC). One of the qualities highlighted is Athens' ability to sustain 'deliberative communications' leading to knowledge 'which is gained by discussion preparatory to action.' In 1960, Simon captured a similar idea by proposing three phases for all decision making: intelligence, design, and choice. However, by primarily giving a cognitive interpretation to intelligence, this idea falls back behind Pericles' insight that discussion is a key to knowledge that facilitates effective action. By its very nature, discussion is dialogical requiring at least two participants and from the nature of Athenian democracy at Pericles' times, we also know that much of it was public. The dialogical and public nature of discussion, which is at the heart of deliberative inquiry, distinguishes it from both intelligence derived from reflection, and participation while not excluding either.

Building on these historical insights the purpose of this paper is simply to a) clarify and strengthen the concept of deliberative communication as a form of deliberative inquiry and b) explain why it is an important topic for IS research that has been neglected in favor of research questions related to technical and economic effectiveness and efficiency (based on instrumental rationality of IS as contrasted with their communicative potential). For the first purpose we draw on the recent literature in social action theory and its application to the theory of democracy.

For the second purpose we draw on the fundamental insight of Churchman's 'The Design of Inquiring Systems' (1971) that epistemological assumptions bear heavily on conceptualization, design and use of information systems. Designing systems requires carefully considering the limits of different forms of inquiry, all the way from Leibnizian to dialectic-Hegelian inquiry and beyond.

We argue that deliberative inquiry improves upon and retains the most important insights of Kant's and Hegel's dialectics from a theoretical and practical perspective. We believe that it overcomes the principal weaknesses of both and thereby provides the philosophically best founded baseline for supporting IS, especially group communications.

Our Approach in this paper is to present deliberative inquiry as a further advance in epistemology combing elements of Kantian and Hegelian inquiry in a more inclusive model. Deliberative inquiry is an application of Habermas's concept of communicative action to the public sphere often referred to as a deliberative democracy. We will draw on the epistemic dimensions of this model, which Habermas detailed at various occasions (see Habermas, 1996; Habermas, 1999 for example).

The rest of the paper is organized into three sections. Section 2 summarizes the Kantian and Hegelian inquiring models and focuses on their principal shortcomings as a practical guide to organizational actions. Section 3 outlines the model of deliberative inquiry and explains how it corrects major shortcomings of the previous two models. This is primarily based on selective aspects of Habermas' theory of the public sphere as developed over time in 'The Transformation of the Public Sphere' (1962), 'Moral Consciousness and Communicative Action' (1990) and 'Between Facts and Norms' (1996). Section 4 states our conclusions.

From Kantian and Hegelian Inquiry to Deliberative Communication

In 1971 Churchman produced an influential framework consisting of five possible philosophical foundations for 'Inquiring' systems. The reason for going back to this reference is that it traces the evolution of epistemology and makes explicit the philosophical-epistemic foundations of various archetypical information systems. Since then epistemology of IS has

continued to draw the attention of IS researchers (see Hirschheim, 1985; Ivanov, 1996; Monod, 2002 for example) testifying to its importance as an object of IS research.

Churchman's Framework

Churchman's systems were based on the epistemic views of Leibniz, Locke, Kant, Hegel, and Singer about the nature of human knowledge and its limits. Churchman describes the Leibnizian model as a 'closed' system that is internally consistent and follows fixed rules for the manipulation of its elementary logical units called 'monads'.

A Lockean system on the other hand searches for consensus on the basis of agreement producing operators that manipulate a finite set of empirical inputs. More sophisticated than these two is the Kantian inquiry model in which multiple and complementary explicit views of the nature of problem are considered in order to arrive at multiple interpretations which can be compared and evaluated.

Kantian systems recognize the need for a priori theoretical structures about the external world. These structures are necessary for the interpretation of the input, according to Churchman's understanding of Kant's transcendental idealism (Churchman, 1971 p. 134). Originally these were the Euclidean model of time and space which are mutually reinforcing. Einstein's theories of relativity proved these models to be wrong on a cosmic level. This discovery would seem to support Mason and Mitroff's judgment that Kantian types of inquiry, 'are best suited for handling problems of 'moderate' ill-structure' (1973 p. 482).

Churchman then interprets the epistemic implications of Hegel's philosophical idealism to construct the next model. Hegelian model is based on a synthesis of two representations that are not just contrary as in 'black' and 'white' but completely contradictory such as 'same' and 'different'. The intense conflict between the two positions help the 'bigger' observer (one who is observing the debate) in surfacing underlying assumptions about the reality or the worldviews (*Weltanschauungen*) of the two positions. Because of its open-ended, evolutionary nature admitting continuing conflict and change, these Hegelian systems appear to be better suited than Kantian for solving *wicked problems,* – those characterized as ill-defined, ill-structured, highly inter-connected and lacking an agreement about the ends themselves not just the means to the given ends (Rittel and Webber, 1973).

The Singer-Churchman model adds further complexity to the Hegelian model by recursively applying all the previous models to a situation in order to asymptotically reach strictly scientific and ethical solutions. These systems put special emphasis on ethics and producing knowledge that is useful to all of mankind. They employ a process of 'sweeping in' variables to explain the results of measurements that are inexplicable under the current worldview, consequently expanding it. The assumption here is that any anomaly or difference in measurement results is a symptom of incomplete understanding of the reality which can be rectified by adding more dimensions to the current perspective. The purpose of Singerian systems is to produce 'exoteric' knowledge, i.e. knowledge that is beneficial to all of mankind and whose scope encompasses all disciplines of inquiry. In these systems, the notion of progress is dependent on better understanding of the world, which in turn depends upon better measurement scales and processes. Ideally, everyone is considered to be a designer and a decision-maker.

We will not go into further details of this model here, although it may be considered as the most sophisticated among Churchman's models. For establishing the basic concept of deliberative model, while remaining within space limitations, it is sufficient to build on Hegel's ideas. We will briefly survey some prior research that has made use of Churchman's framework.

Application of Churchman Models in IS Research

A number of IS researchers have attempted to build on Churchman's seminal ideas. Their attempts have met with varying degrees of success in practical applications. Mason and Mitroff (1973) proposed a framework for management information systems consisting of five classes of variables including Churchman's framework as a core variable. Nelson and Mitroff (1974) proposed the idea of Dialectic Information Systems (DIS) in which the same data is presented in two completely antithetical points of view to the decision maker who can synthesize the conflicting views into useful information. Hodges (1991) developed a prototype system called Dialectron, which helped users manage dialog in the process of generating synthesis. Klein and Hirschheim (2001) mention Hegelian 'dialectical inquiry' as a 'design' ideal for information systems. Haynes (2001) analyses Hegelian Inquiring model's contribution to the emergence of learning culture and elaborate their implications for information systems as social systems bound to technology. Monod (2002) calls for a Kantian foundation for IS, while Carugati (2004) argues that various inquiring stances are used simultaneously by the users instead of exclusively as suggested by Churchman. Richardson, Courtney et al. (2005) incorporate the notion of Hegelian Inquiring model into the development of their prototype system DISCOMAP.

Churchman's models are based on evolving and ever more complex forms of epistemology. However, the evolution of epistemology did not end there. The most recent advance is the deliberative model. Relatively speaking, this model can best be explained by noting its differences to the Kantian and Hegelian models. Therefore we will focus on these two, for the purpose of introducing the key features of the deliberative inquiry model. Some of the salient differences between the three models are given in Table 1.

Insert Table 1 around here

Kantian Inquiring Systems

Kant's epistemology distinguishes between 'things in themselves' and 'things as they appear' to us, or between 'noumena' and 'phenomena' as he calls them. The Columbia Encyclopedia (2001) explains that 'Noumena are the basic realities behind all sensory experience'. In Habermas's (2000) words, Kant distinguishes 'between the intelligible realm of freedom, which is directly accessible to transcendental reflection, and the world of intrinsically unorganized phenomena on which the human mind imposes its categories.' Since noumena are not directly knowable, an inquirer's only connection with reality is through its representations. This is the core idea of Kant's epistemology (1781), which requires an inquirer to employ epistemological pluralism for solving problems.

Kantian approach to problem solving seeks 'to formulate the 'given' in such a way that the pathway from the given to the solution will be the easiest one to find' (Churchman, 1971 p. 140). Therefore an important requirement is to have an adequate 'fit' between the data and the model. Habermas characterizes a Kantian inquirer as 'a finite mind, manipulating concepts, that operates rationally within the restrictions of a world independent of it, and self-reliantly within the limits of a social environment' (2000 p. 322).

Thus, the decision maker's task is to identify problems to be solved, determine which alternate representation would 'best fit' the problem, and to determine if an optimal or sufficiently acceptable solution has been found. The inquirer is also responsible for validating the soundness of its own interpretive structures, as well as stopping rules. Therefore, self- reflection and self-examination is critical.

However, Kantian systems can fall into 'competency traps' (Malhotra, 1997) as there is no element of conflict or opposition between the alternate representations. Even more seriously, there are no guarantees that self-examinations will always be successful (Churchman, 1971 p. 129) as these systems are strictly monological and rely only on internal logic to make sense of external data.

Hegelian Inquiring Systems

Hegelian systems are based on the notion that 'through the conflict of ideas comes greater enlightenment' (Churchman, 1971 p. 185). Since conflict is necessary, it follows from the Hegelian dialectic that no single observer alone can construct an objective worldview or an image of reality with the help of data captured directly from the 'objects' under inquiry (cf. http://plato.stanford.edu/entries/hegel/).

In these systems, information is meaningful only in relation to some 'worldview' or contextual assumptions about reality. A first requirement is the initial collection of 'as broad a sweep of the 'data' as possible' (Churchman, 1971 p. 170). Next comes the generation of a conviction about some fundamental thesis. Then comes the construction of an antithesis that is maximally supported by another worldview. Finally, a master observer is required to observe the conflict between the thesis and its antithesis and construct a higher level worldview.

However, there are some difficulties here. Firstly, the question of how a thesis is produced in the first place remains unanswered. Secondly, the process of generating the antithesis is unknown. The mechanism by which the synthesis always emerges is even more mysterious. Are there any built-in guarantees that the perspective of the master observer will be bias-free? (Churchman, 1971 p. 177)

The number of perspectives is restricted to two, and the question remains whose perspective should be counted as valid and legitimate? If we delegate this responsibility to the experts, who is going to attest to their expertise? Or shall we delegate this responsibility to 'logic' only?

Even though the Hegelian inquiry model shows us two antithetical perspectives it remains insensitive to true human nature treating them as mere parts of a much larger 'superhuman' system through which 'the cunning of the Universal Spirit' guides world history to its ultimate destination unbeknownst to everyone.

Conflict resolution requires that all parties be heard and no one be excluded, which is a mark of injustice. Hegel offers no guarantees that such an inclusion will actually take place. On the other hand deliberative inquiry requires that all rational points of view should be made available to everyone, and only the merit of these arguments should determine their acceptance. We will look at this model in detail now.

The Model of Deliberative Inquiry

In order to elaborate on the ideas of deliberative inquiry, we will pursue a body of literature that so far has received little attention in IS literature. It means to follow a different path, less traveled, that has been pioneered by philosophers and political scientist interested in the theory of democracy.

Deliberative Communications

Deliberative communication or inquiry is a key to coordination, collaboration, and conflict resolution and it plays an important role in organizing human action. It is based on the notions of communicative rationality and universal pragmatics as defined by Habermas in *The Theory of Communicative Action*. Habermas notes that, 'We are the beings who essentially participate in the practice of 'giving and asking for reasons'' (Habermas et al., 2000, p. 1). Deliberation may be contrasted with 'strategic' communication, which employs promises and threats in an attempt to influence the behavior of listeners. It is oriented to success, achieved by applying best means to given ends. Deliberative communication on the other hand, is about the ends themselves and is oriented toward unforced consensus.

Its Nature, Purpose, Process and Preconditions

In philosophical tradition going back to Aristotle's time, deliberation is considered as a process of will formation. It refers to those moments that precede decision making in which individuals or groups ponder over and weigh together various alternative solutions before deciding on one (London, 1995 p. 40).

Deliberative inquiry is characterized by 'an intention on part of deliberators of changing their judgments, preferences, and views during the course of their interactions, solely on the basis of persuasion rather than coercion, manipulation, or deception' (Dryzek, 2000 p. 1). This is precisely what Habermas means by communicative rationality; reaching agreement based on open, free and fair discussion. Here open means inclusive and public, free means not distorted by external factors like economic and political considerations, and fair means that all participants enjoy equal rights of contributing and challenging.

Its Importance for Organizations

There are numerous avenues within commercial organizations where deliberative communication may be fruitfully employed. Participative system design, strategic management, teamwork, shareholder debates, and employee empowerment are just a few such opportunities. Mumford (2003) believes that more flexible and robust organizations can be developed by allowing employees and small groups to participate in and deliberative about work system design and its operation. Inglehart (1997, p.29, 193) emphasizes that members of postindustrial societies have greater need for self-expression, and greater say in decision-making whether in the context of workplace or in the matters of public concern.

Horita and Iwahashi (2002) claim that 'policy-making is all about managing conflicting values and differing views of the world held by a large number of stakeholders' which obviously calls for deliberation. German philosopher Hans-Georg Gadamer observed that 'the knowledge that gives direction to action is essentially called for by concrete situations in which we are to choose the thing to be done; and no learned or mastered technique can spare us the task of deliberation and decision' (quoted in London, 1995).

Its Role in Society

In contrast to the Liberal and the republican models, a new model of democracy is gaining increasing popularity and is attracting considerable attention from the scholars of political philosophy (Cohen, 1989; Fishkin, 1995; Benhabib, 1996; Bohman, 1996; Gutmann and Thompson, 1996; Dryzek, 2000). This is a model of democracy based on deliberative inquiry and is called the model of deliberative democracy. This model is based on the core idea of

> 'citizens and their representatives deliberating about public problems and solutions under conditions that are conducive to reasoned reflection and refined public judgment; a mutual willingness to understand the values, perspectives, and interests of others; and the possibility of reframing their interests and perspectives in light of a joint search for common interests and mutually acceptable solutions.' (Sirianni and Friedland, 2007).

Deliberation provides not only a democratic way of resolving issues but also a means for social integration (Habermas, 1996) - a significant achievement in absence of any integrating overarching metaphysical or normative principle in modern society. For Bohman (1996) 'deliberation is necessary if decisions are not just imposed on citizens; it is needed to legitimatize laws and thereby creating the obligation for citizens to obey them'. Similarly Cohen (2002 p. 89) maintains that public deliberation 'shapes the identity and interests of citizens'.

A Comparison of the Three Models

As we have seen above, both Kantian and Hegelian models are based on what Habermas' calls the philosophy of consciousness (Habermas, 1971 p. xiii; see also Klein, 2004 p. 128). Habermas asserts that for today's world, which is characterized by a plurality of values and heterogeneity of worldviews, this philosophy is insufficient as no theory based on it can do justice to the complexity of modern societies. The philosophy of consciousness implies a world view composed of thinking 'subjects' acting upon given 'objects' and thus give rise to the notion of instrumental rationality, whereby a subject seeks the best method to achieve a given end. In today's IS world this type of rationality is the dominant mode of rationality in use. However, Habermas asserts that this view of rationality is one-sided and presents an impoverished and mechanized view of life (see also Klein and Hirschheim, 1991).

Kant assigns a high pedestal to the concept of rationality; however his notion is monological and can not bear the cognitive burden of complex systems. Habermas agrees that rationality should be the ultimate basis of inquiry. However, he expands the notion of rationality and finds its locus not in an individual subject like Kant does, but finds it in intersubjective deliberative communications. Thus he converts Kant's monological conception of rationality into a dialogical one. This brings him closer to Hegel, who emphasizes multiple actors and perspectives confronting in a public manner. However, he goes beyond Hegel by replacing conflict by coordination and consensus as the litmus test for truth and progress.

In the case of Hegel, rationality is attributed to the 'cunning of Grand Spirit', that guides unaware actors to the truth. On the other hand communicative rationality is oriented toward mutual understanding, unlike instrumental rationality which is oriented toward success. Communicatively rational social actors negotiate situation definitions mutually by raising and redeeming three kinds of validity claims; claims of truth, normative rightness, and sincerity of expression.

The implication of this for IS is that in modern complex societies it is not sufficient to base the design of information systems on instrumental rationality alone. The deliberative model urges us to look at not only the cognitive side of design, but also the normative and aesthetic sides. The epistemology of the deliberative model of inquiry suggests that the truth can not be arrived at by internal reflection or by accidents of history; rather it can only be achieved intersubjectively and by engaging in free and fair deliberations, undistorted by political and monetary concerns.

Conclusions

The first conclusion which emerges from the above discussion is that IS has devoted most of its attention to improving the effectiveness of systems based on instrumental rationality beginning with early Transaction Processing Systems that are still in use, emphasizing throughput and more lately also focusing on workflow and control of business objects (cf. Alter, 2006). The significance of this research orientation is not to be doubted, but it does leave out support of the communication during the necessary will and goal formation typically preceding strategy and systems designs. If instrumental action and communicative action are two sides of a coin, we can argue that IS research has missed half of its mission.

However, some special approaches in IS literature have emerged dealing with communications for the improvement of deliberations preceding goal formation and decisions making. These include IBIS (issue-based information systems), construction of collaborative spaces, negotiation support systems, and large-scale-distributed meeting support systems. Their results so far have been as varied as the approaches taken.

Most recently, the research approaches to social communication support have received important new ideas from the increased capabilities of Internet-based ICTs. Notably, the debate on and experiments in e-democracy have provided much food for thought and shed additional light on the issue of how to support public deliberations. Klein and Huynh (2004 p. 223 - 224) state that although the Internet has ample potential for deliberation and communicative function, for some reason it has not materialized yet. They deem it to be an important research issue to attempt to understand why this has not happened so

far. They also insist that if, indeed, IT has such a potential, then IS research must focus on the design of appropriate systems to support deliberative inquiry.

Recent Internet phenomena such as blogs, and other virtual communities such as MySpace, YouTube, digg, and del-icio.us, are signaling a movement away from systems primarily aiming at supporting instrumental rationality. However, we have not seen a similar movement within IS research for the support of social communications in organizations. Yet, the fact that such systems have appeared on the scene and are increasingly successful is evidence that the time is ripe to look for alternative epistemological foundations for ISD for which the deliberative inquiry model is a good example.

Further research should address at least two sets of questions with regard to such communicative systems. *First*, how does deliberative inquiry take place in real life settings? Which forms of deliberative inquiry can we observe? *Second*, are there any aspects of the process that could be supported by technological features? If so, what are the best ways to support them? *Third*, how strong is the link between improved deliberative inquiry during the front end of systems design (e.g. requirements determination and quality assurance) and better system designs? Beyond theoretical grounds, is there any evidence that a link does exist? These concerns call for a thorough empirical study of the triangular interdependencies among deliberative communities, the technologies they use, and the quality of their accomplishments at different levels of society. Hopefully, the results of an empirical study addressing these questions will become available in the near future (cf. Asif, 2006).

Table 1 The Principal Characteristics of Hegelian and Deliberative Inquiry

	Kantian Inquiring System
Philosophical Foundation	Kant's theory of Knowledge as expounded in *Critique of Pure Reason*. (1781)
Illustrative quotes	'Even though all our cognition starts with experience, that does not mean that all of it arises from experience'[1]
Number of engaged perspectives	Only one
Orientation of the Engaged Actors	Self-reflection, only one actor engaged
Number of data sets used as evidence	Only one data set or base of evidence that is interpreted in multiple ways by the same actor
Outcome of the interaction	There is no interaction involved
Stopping rule, notion of progress or direction	Self-determination, escape from self-imposed tutelage, reason as a basis of emancipation
Key Implication for IS research	Determining how to develop most accurate and efficient models.
	Hegelian Inquiring System
Philosophical Foundation	Hegel's writing on idealism and the philosophy of history. (Hegel, 1977 (1807)).
Illustrative quotes	Nothing great was ever achieved without passion
Number of engaged perspectives	Initially only two for each dialectical cycle, but four over two cycles (cf. outcome below): thesis and antithesis
Orientation of the Engaged Actors	Dogmatic advocates of their perspective; maximally hostile to each other and opposed to any compromise

[1] Kant quoted by Monod (2002).

Number of data sets used as evidence	Only one data set or base of evidence that is interpreted differently by the opposed theoretical perspectives 'because experience confirms what the concept teaches'
Outcome of the interaction	The contestants will never agree, but a new actor is assumed to emerge combining the best points from both into a synthesis that then become the thesis for the next dialectical cycle. Coordination is the outcome of the cunning of the spirit occurring through the unfolding of the world history unbeknownst to the actors
Stopping rule, notion of progress or direction	None, progress is not guaranteed except that Hegel assumes that the universal spirit reveals itself on the 'stage of history' through the dialectical process until the final synthesis yields 'the absolute idea, at which point the spirit will have resolved the dialectic between the temporal and the eternal. Cf. http://www.bedfordstmartins.com/litlinks/critical/hegel.htm
Key Implication for IS research	How to support debate, dialog and multiple interpretations of data throughout the organization.
	Deliberative Inquiring System
Philosophical Foundation	K-O Apel's linguistic foundation of ethics and Habermas' TCA, especially discourse theory
Illustrative quotes	'We are the beings who essentially participate in the practice of 'giving and asking for reasons'. In calling one another to account, we accept responsibility before one another for everything we do' (Habermas et al., 2000, p. 1)
Number of engaged perspectives	Several, some of which may be partially overlapping making negotiation and compromise possible. Additional perspectives may join any time as they emerge.
Orientation of the Engaged Actors	'Agreement-oriented'; sincerity and willingness to consider the merits of arguments is presumed implying that change of mind in response to emerging new information is possible
Number of data sets used as evidence	Multiple data sets or bases of evidence; these may be partially disjoint (contradicting each other) and partially overlapping (congruent with each other)
Outcome of the interaction	A broadly based consensus on the most acceptable compromise is hoped for, but by no means certain. Voluntary coordination of action by appeals to reason is the intended outcome
Stopping rule, notion of progress or direction	Arguably, the force of the better argument will eventually lead to a compromise that is accepted by its logical merits by most if not all participants under prevailing circumstances. If these change a new deliberative cycle may be initiated by anyone. Over longer periods of time the enlightenment ideal presumed to lead to the betterment of the human condition both materially and socially.
Key Implication for IS research	How to incorporate broader conception of rationality in IS research, especially how to strike a balance between instrumental and communicative rationalities.

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