Extensions to Churchmanian Inquiring Systems in Order to Support Learning in Organisations and Group Support Environments

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Abstract

This paper examines the support for Churchmanian Inquiring Systems offered by a group of 20\textsuperscript{th} century philosophers. Whilst being, in itself, an analysis, synthesis and consolidation of abstract theory, it acts as support for the design of information systems. This is expected to be relevant for those theories of information systems development which relate to organisational learning (Boland, Tenkasi and Te’eni, 2001), or to system design for technology supported group work (Rana, Turoff and Czech, 1996). This paper follows Courtney Croasdell and Paradise (1998) in the use of the term inquiring organisations. They derive their concept by analogy with Senge’s (1990) concept that organisations can only survive if they have a competitive edge. Further, this competitive edge cannot be maintained unless the organisation, as a whole, is capable of learning from its experience. The original selection of supporters of specific inquiring systems reflect the development of philosophy in Europe between the 17\textsuperscript{th} and 18\textsuperscript{th} centuries, together with E.A. Singer in America. This selection was adequate for the design of data processing systems, but does not “facilitate dialogues among the organisation’s community of inquirers” (Boland et al, 1994:464). Consequently, Scheele (1975) suggests that an inquiring system be recognised which is based on the phenomenology of Husserl, Heidegger and Merleau-Ponty. They suggest that using Merleau-Ponty as a label for such an inquiring system would be a reasonable compromise. The argument that the ideas of phenomenology will be useful is developed Haynes (2000). He advocates the use of Heidegger and his phenomenology to support “Ethical Enlightenment” in system design. Further, Boland et al. (1994) require hermeneutics to support distributed cognition, for which they use the work of Gadamer. This is significant because Vance (1997) points out that the school of thought propagated by Gadamer, Heidegger, Derrida and Foucault is not the one usually followed. Instead Vance argues that the school of Dilthey is the one most often considered. The aim of this paper is to clarify this tangle of ideas.
Keywords
Inquiring Systems, phenomenology, hermeneutics, distributed cognition, learning organisations, group systems support.

Introduction

The following paper examines the conceptual support given to some learning and problem solving situations by Churchmanian Inquiring Systems. These abstract systems provided theoretical support for the design of information systems which have the characteristics identified by Mathiassen (1989) as being in Era I or II. For systems which belong to Era III, this is not so certain. The focus is on both Group Systems Support (GSS) and Learning Organisations. In both cases there is an interest in distributed cognition. Consequently, alternatives have arisen. The aim of this paper is to introduce inquiring systems and their properties. Novel ways of developing systems, which reflect new ways of working co-operatively within an organisation and with the associated technologies are described.

Background

Boland (1991) argues that it is useful to recognise research in information systems as a study of how texts are produced and read in an organisation. He concludes that this approach allows the focus of interest to move away from concern over how well a situation is represented to concern over whether all the possibilities for that situation and the people within it had been considered. Further, attention would move from a user’s information requirements (which are still there) and have the information system as a device to provide this information on to an examination of the individuals in their environment and their values, with the information system seen as a means of developing meaning about those people in that environment. This approach is not expected to be imposed at the expense of those methods on those currently focussed on encapsulating a situation, but it would offer a new way of talking about information systems and its users in a potentially fruitful way.

GSS can be distinguished in terms of the constraints allowed and the communication catered for. Hence, these systems will have meetings which are face-to-face, or non-face-to-face with synchronous or asynchronous communication for text, graphics, audio, or video. A corollary to these distinctions is that the media used in such a system, differ in terms of the richness of information they are capable of conveying. Consequently, Rana et al. (1996) argue that the various inquiry systems will support the manner in which a particular group chooses to validate the outcome of a specific process and that this will also imply the form of media support that will be most effective. For example, there is a recognition that some contexts will encourage the use of rational and objective procedures, while others will give rise to interpretative approaches where members use their judgment and past experience. This latter condition is seen to arise most frequently under conditions of negotiated and conflictual approach to validation. Rana et al. (1996) argue that under such circumstances, the task environment is ambiguous and not amenable to objective analysis and that group members exhibit a strong attachment to their self interests, beliefs and values, which in turn lead to very different interpretations of the problem situation. Rana et al. (1996) emphasize that, even though a particular approach may
be best suited to a specific situation, in practice the group members may or may not adopt this approach. Similarly, the situations suitable for one of the other approaches, such as inductive, relative, negotiated, or conflictual, could be subjected to an inappropriate validation approach by a group. Again, the media richness requirements are highest for task situations involving conflictual validation, and they are the lowest for the deductive validation. Consequently, in a conflictual approach, face-to-face meetings (representing a rich medium of communication) would be more critical to the successful performance of group tasks than those relying on inductive or relative approaches to validation. Further, it should be remembered that different computer based process support tools will be required, depending on the context. While any specific scenario could be supported by a “classical mode” system, it is useful to consider looking for another system which is as flexible as the environment that it supports.

The need for this search is enhanced when the work of Courtney, Croasdell and Paradice (1996, 1997) on learning organisations, are considered. However, in order to see what is required, we need to know where we are. The next section, therefore, introduces information systems.

**Introduction to Inquiring Systems**

An inquiring system is a general system which attempts to represent the process of inquiry, as performed either by an individual or a group. It represents an ideal type. It should be recognised that conceptualisation cannot begin without making some assumptions. The inquiry will consider an 'external event' or 'raw data set' which forms part of the 'real world'. The data needs to be transformed to the 'right form' for input into a model. The model can be any sort of structured process, represented by a set of rules in the form of an algorithm or a set of heuristic principles. The model acts on the input, transforming it by a recognised operator into output or valid knowledge for action. An input is an entity that a particular inquiring system recognises as the basic legitimate building blocks for knowledge. Churchman (1971:19) recognises that input, in the context of design, represents various items, depending on the context and viewpoint of the designer. The valid inputs for one inquiring system could be invalid in another. For example, raw facts or observations are appropriate for a Lockean system, as it assumes that data comes before theory is developed, but not for Kantian or Hegelian systems, which require explicit theories to be assumed. The whole process is predicated on a recognised guarantor which may be as insubstantial as hope. However, even science can do no more than that. For example, O’Hear (1989), when discussing whether or not a Popperian approach to the scientific method provides reasons for future actions only on induction assumptions, says "the Popperian ... [will say] ... that we may still act on such theories in the hope that they are true. And the critic will say that he had hoped for more than hope in science." However, it should be remembered that paradigms guarantee a solution exists (Masterman, 1970).

Other aspects to be included in a perception of an inquiring system are:-

- Preferred definition of objectivity / education
- Preferred measure of performance for evaluating output
- The mood in which the system expresses itself - empiricists - indicative - is / is not
• Notion of systems separability - what things are under direct command and what are taken for granted and so outside the system. What is reasonable and makes sense from the perspective of one inquiring system may make absolutely no sense at all from that of another
• The number of views of a problem that it presents formally
• The types of problems for which the system is best suited.

For Churchman's enquiry into the nature of inquiring systems, there are three generic figures - the Designer, the Client, and the Decision Maker. The Designer invokes a world in which the Client could change whatever was wished within the bounds of limited resources. He seeks to describe the underlying principles of the Client's choices, using a 'measure of performance'. He has a value structure identical to that of the Client. As an actor in this scenario, the Client is considered only in terms of his value structure. With this, possible futures can be described and, in principle, ranked against each other. The Decision Maker coproduces the future along with the environment, which he does not control. He also has a value structure, but it is not necessarily the same as that of the other two actors. The Designer has to identify Client and Decision Maker.

In order to identify the relevance of Churchman to the issues of rationalism and interpretivism, it is noticed that Churchman identifies two strands of thought addressing systems design (Churchman, 1971, pg. 71) - pluralism and monism. The pluralist is a problem solver, incrementalist, individualist and empiricist. He doesn't believe that systems have objectives - "only people have objectives". Pluralists "see and design their world in pieces" and consequently, would now be considered to be reductionists. The monist, on the other hand, believes that existence has a purpose and that the purpose is good. This is the "best of all possible worlds" either because it is the only possible world (Spinoza) or designed by a perfect designer (Leibniz). Monists "see and design [their world] as a whole and consequently, would now be considered to be interpretivists." Churchman works to a framework of four basic design techniques, based on the criteria of clear and distinct ideas and input. The design techniques are built on:-
1. Elementary inputs which are clear and distinct (Locke).
2. Clear and distinct ideas that are not inputs (not given externally) (Leibniz).
3. Unclear inputs (Kant).
4. Unclear material that is not an input (Hegel and Singer).

The first three are shown to be unsatisfactory from a design point of view. He argues that an inquiring system is a system of knowledge development. Science is held to be inadequate as it leaves out the 'human spirit'. This term could well be interpreted as 'politics' or 'personal viewpoint', in which case this supports the proposed move to interpretivism. In particular, (Churchman, 1971, pg. 12) science does not tell practitioners "...how they should feel about knowledge". This reflects an assertion of Spinoza - "Without a clear concept of the ultimate human values, one cannot appreciate understanding and without a God one cannot evaluate understanding." (Churchman, 1971, pg. 12). Further, the design system, through its internal processes, must be able to guarantee the validity of what it takes to be clearly correct statements or ideas.

The Leibnizian inquiring system is used by much of theoretical science as it is focused on well understood problems. Consequently, the perceived models take
priority over any data. Truth is regarded as being analytic, depending entirely on its formal content. A formal model of a system is generated and the truth of the model is measured by its ability to offer a theoretical explanation of a wide range of general phenomena given clearly stated conditions under which the model holds. Consequently, truth does not depend on empirical data. Given that this data must be finite in extent, it is considered always to be too small a data set to justify the inference of any general proposition. General propositions will only be accepted if it can be justified from a formal model or argument.

A Lockean inquiring system, on the other hand, is the one used by much of empirical science. Truth is experiential, depending entirely on its empirical content. Systems are modelled empirically and the truth of the model is measured in terms of users' ability to reduce every complex proposition to its simple observations. Thus, the data has more significance than the model, as it is the data that justifies (or induces) the model. The truth content of the outcome is determined by the consensus among group members. The level of consensus on the validity of the outcome (i.e., solution acceptance) rests upon the level of agreement among group members on the implications of the data (or observations and findings). An inductive approach is generally applied when many of the connections to be made between observations of the group are largely subjective in nature. Example: Reviewing an ongoing project. In this case the subjective judgments and observations of group members, as opposed to logical sequencing of variables involved, play a strong role in arriving at the recommendations.

Locke's inquiring system has no pre-existing memory, or built-in preconceptions. It can receive inputs or information and combine information with logical operators together with other operations, such as reflection and generalisation. It appears that (Churchman, 1971, pg. 101) the Lockean community allows new novices into that community if they use the same semiotics as the community. To be a full member of the community inquirers need to be actively asking questions. As Churchman puts it (Churchman, 1971, pg. 102) "Lockean inquirers have an ability to generate sentences in the indicative mood as a result of a sensory response".

Churchman identifies a major problem for this system to be that of recognising objective evidence. He sees this as a problem of system design (Churchman, 1971, pg. 119). Other design problems are those of innate ideas, communication, induction and the economics of information. Innate ideas are not built on by Lockean inquirers (in theory), but as Berkeley pointed out (Churchman, 1971, pg. 122), "the designer cannot define a non-innate idea as arising from 'outside' the inquirer". Consequently, the problem with a Lockean inquiring system is ensuring the reality of its inputs. This is a rather different guarantor problem than for the Leibnizian inquiring system. For Locke, the community needs to be designed in a specific way, with "an explicit formulation of its legal structure and the determination of the manner in which this legal structure influences the ... data and the generalizations of the inquirers." (Churchman, 1971, pg. 123). Care also needs to be taken with the language used when generalisations are induced into the community. Lastly, there is never enough time to 'complete' an empirical enquiry, even in theory (Churchman, 1971, pg. 124). Consequently, the Lockean system must be embedded in larger systems. The 'objectivity' of a Lockean inquirer is defined by the larger system of which it is a part (Churchman, 1971, pg. 125).
For a Kantian inquiring system, truth is synthetic. The truth of any model is measured in terms of the model's ability to relate theory to data and data to theory. This addresses the problem that reflects the limitations of the first two systems. That is that Leibnizian inquiry emphasises theory to the detriment of data and Lockean inquiry emphasises data to the detriment of theory.

For any problem, build at least two alternate representations or models of it. If these alternatives are complementary, then a Kantian inquiring system is being used. If they are antithetical, then a Hegelian inquiring system is being used (see below). An example of its use is offered by Rana et al. (1996). If there is a problem concerning which computer system to buy, then the decision making process will generally be dominated by comparing features and prices of various vendor products to the budgeted amount and the expected uses of a computer.

Churchman is not surprised that inquiring systems based on Locke and Kant ran into problems as they separated themselves from the system that they were observing.

In order to increase objectivity we need to be able to see a particular object from different points of view. Using Hegel's approach to knowledge, Churchman intends to increase the objectivity of experience by basing it on "some kind of interconnection of observers" (Churchman, 1971, pg. 149). In contrast, for Lockean inquirers, objectivity is agreed when there is a strong agreement in the Lockean community. There is no control over whether they have been sensible, or as Churchman puts it - "conventional". To overcome this Churchman suggests that "no observation can become objective unless the observer is also observed objectively" (Churchman, 1971, pg. 150). He thinks this is an obvious point that often gets overlooked. In this inquiring system, truth is derived from a debate between a 'plan' and a diametrically opposed 'counter-plan'. The plan and counter-plan represent strongly divergent conceptions of the whole system. Hence, the alternative name for this inquiring system - Dialectic. It is assumed that both plan and counter-plan can be formulated on any issue and that there is a set of data which satisfies both. Whereas agreement is the guarantor for the validity of a proposition for the Lockean inquiring system, for the Hegelian inquiring system, it is conflict. Hence, this inquiring system is very useful for studying "wickedly" ill-structured problems. Notice that the "mere opposition of thesis and antithesis does not mean that the perspective of the inquirer is broad" (Churchman, 1971, pg. 176). Consequently, there is no guarantee that the process will lead anywhere. While agreement is not always reached, when it does occur, synthesis is likely to be stronger than would have been the result in other inquiring systems. However, we note that Cosier and colleagues found other approaches more useful (Cosier, 1981a, 1981b Cosier, Ruble and Alpin, 1978).

"The Lockean inquirer displays the 'fundamental' data that all experts agree are accurate, and then builds a consistent story out of these. The Kantian inquirer displays the same story from different points of view, emphasising thereby that what is put into the story by the internal mode of representation is not given from the outside. But the Hegelian inquirer, using the same data, tells two stories, one supporting the most prominent policy on one side, the other supporting the most prominent policy on the other side." (Churchman, 1971, pg. 177). Alternatively, following Churchman, one could be optimistic, with "the promise that the movement
from thesis-antithesis to synthesis is a soaring to greater heights, to self-awareness, more completeness, betterment, progress" (Churchman, 1971, pg. 186).

The Hegelian system uses two viewpoints - thesis and antithesis. Singer goes beyond this by requiring three or more viewpoints. Singer uses the "whole scope of inquiry" to aid in the design task (Churchman, 1971). This is in response to the concern that the problem may be incorrectly formulated because too narrow a view was taken. Consequently, the inquirer goes through a continual process of reflecting on and going beyond the current definition of what is in and what is not in the current problem. This is Singer's 'sweep-in' process (Ulrich, 1988). The hope for comprehensiveness remains, therefore, an unattainable ideal (Ulrich, 1988). No final solution is ever reached, as there is always more to be swept in. Ideally, the inquiring system is about everything, and everybody is involved in it (Churchman, 1971). Consequently, Churchman makes much of the decision makers who are "inspired by the heroic mood to depart from the safe lands of the status quo."

Singer also argues that the logic of science is in the imperative mood, with answers in the indicative (Britton and McCallion, 1994). Singer's inquiring system needs a language that can convey what has been learned and what has yet to be learned. In English the indicative mood is used to express what has been learned, but it does not capture what has not been learned. Singer suggests that the imperative mood should be used. This represents an ethical judgement on the part of the community, in that the community judges "that to accept its instruction is to bring about a suitable tactic or strategy in the grand teleological scheme" (Churchman, 1971, pg. 202). This avoids a problem Churchman found for Locke "how does the inquirer get from an assertion in the indicative mood to a command?" (Churchman, 1971, pg. 115). Consequently, the query as to how the inquiring system's language can pass from 'is' statements to 'ought' statements, is not a problem for Singerian inquirers - they only use 'ought', formally.

**Distributed Cognition and Inquiring Systems**

Courtney et al. (1997) characterise Lockean Inquiring Organisations, as organisations that use the principle of induction to build their understanding of the outside world through the receipt of information via simple observations. This information is then verified by comparing it with the observations of several other employees. This information can then be linked into compound properties, through the use of “and”, “or” and “not”. However, it is critical that the observers can avoid the development of an unmanageable data base of these observations, by being able to recognise which of the observations are or are not, ultimately important. Courtney et al. (1997) suggest that the best way of achieving this is through training.

Courtney et al. (1997) suggest that enterprises that need to be able to keep in close contact with their external environment might belong to this class. (For example, retailers and service files.) In particular, Lockean organisations would be able to take into account cultural attitudes as well as the organisation’s “local language”.

Hence, in more general terms, for a group working within an organisation, a group process starts with some "raw data set" that represents some aspect of the real world. The group applies some transformation to the data to bring it to a form useful for
some "model" (or structured process, rules, or algorithms, or heuristic principles). The model is applied to the data and subsequently passed through some filtration process and finally recognized as a group outcome (or decision). Mitroff and Turoff argued that the Inquiring Systems (IS) can be differentiated based upon the (1) priority assigned to the various components of the above system (e.g., data vs. model) and (2) the degree of interdependence assigned to the various system components. In our terms, the two factors would serve to draw distinctions among the nature of problem solving (or decision making) process (Turoff, et al, 1993) and hence the approach adopted by the group to validate the truth matter of group decision/outcome. The following section describes various inquiring systems. The inquiry philosophies described are taken from the work by Churchman (1971) and Merleau-Ponty and Heidegger. The objective is to highlight the distinctions and develop an interpretation useful for determining which IS would be most suitable for which type of group task situations. Once, the suitability of an IS for a given task situation is recognized we also argue for the level of media richness that would best serve the group process.

The group negotiates truth does not necessarily depends upon the physical reality. A negotiated approach to validating the truth content of the task is typical of situations where there may be an agreement on values but self interests of parties involved are in conflict. Example: Deciding new strategy for a company, or union management negotiations.

Hermeneutics and Phenomenology

Palmer (1969) identifies six different definitions of hermeneutics that form a set of inter-related and partly overlapping concepts. The original conception, restricting hermeneutics to the study of biblical exegesis had been extended to philological exegesis. (According to the Shorter Oxford English Dictionary, “exegesis” means “interpretation of the scriptures”. Such usage being recorded in 1832.) For this paper, we select what is directly relevant from Palmer. Therefore, in this context, the first philosopher of note is Schleiermacher (1768-1834), who saw hermeneutics as a means of understanding, by moving away from hermeneutics as an aggregate of rules to hermeneutics as a systematically coherent science. This develops philological hermeneutics to a general hermeneutics which is no longer associated with a specific discipline of study. The significance is that hermeneutics is now seen to be “the study of understanding, itself”.

Dilthey, who was one of the great philosophical thinkers of the late 19th century, acted as Schleiermacher’s biographer. Dilthey wanted hermeneutics to be a core discipline on which other disciplines would be founded when attempting to understand an individual’s “art, activities and writings.” Dilthey sought a critique of reason in the human sciences that would correspond to Kant’s insight’s for the natural sciences. As Palmer (1969) puts it, Dilthey found hermeneutics a suitable discipline with which to “formulate a truly humanistic methodology for the Geisteswissenschaften.

Heidegger’s (1889-1976) first major work, Being and Time, appears to return to a view of ontology which existed before Kant (Gorner, 2000). Heidegger focussed on Being, not consciousness or subjectivity, and undertook a phenomenological study of man “being in the world”. This became recognised as a “hermeneutic of Dasein” (Palmer, 1969). In this conception, hermeneutics is connected “with the ontological
dimensions of understanding” and with Heidegger’s “special kind of phenomenology”.

Following Heidegger’s lead, Gadamer developed Heidegger’s hermeneutics into a systematic “philosophical hermeneutic”. Gadamer tries to relate hermeneutics to aesthetics and the philosophy of historical understanding. “It presents, in well-developed form, the Heideggerian critique of hermeneutics in the older style of Dilthey”. It also reflects some of Hegel’s thinking. Gadamer sees hermeneutics as “Being through language.”

A further development is found in Ricoeur, based on a renewed focus in exegesis. For Ricoeur, hermeneutics is the process of deciphering but not just of texts. He includes the study of dreams, as an exegesis which allows the latent meaning to surface. Ricoeur identifies two “syndromes of [modern] hermeneutics”. One deals lovingly with the symbolic in an effort to recover a meaning hidden in it”, or “demythologising”, represented by Bultmann. The other seeks to destroy the symbol as the representation of a fake reality”, or, demystification represented by Marx, Nietzsche and Freud. Ricoeur and French phenomenological philosophy lead on to Merleau-Ponty.

Heidegger’s version of phenomenology is sometimes called “hermeneutic phenomenology”. This recognises how different Husserl’s and Heidegger’s ideas on phenomenology were, despite some of Heidegger’s early conceptions being based on Husserl. They were used by Heidegger for an enhanced purpose. There is also a difference in attitude towards science. Husserl trained as a mathematician, but Heidegger as a theologian. This distinction is echoed in their attitude to philosophy. Husserl seeks to make philosophy “a rigorous” science. For Heidegger, “scientific rigour was not a final goal”.

Summary and Conclusion

The last section indicated different perceptions of hermeneutics and phenomenology developed. Work is currently continuing on identifying appropriate characterising questions for inquiring systems which reflect these strands of thought together with the identification of the corresponding learning style characteristics.

This paper has brought together the foundations for inquiring systems which will support the development of sense-making systems built around shared understanding.

References


