



ARGUING FOR KNOWLEDGE-SHARING

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ABSTRACT

This paper discusses the conceptual basis for a social-technical system aimed at assisting geographically separate companies to use the Internet to achieve the economic benefits of clustering. The knowledge sharing literature, and the evolutionary economics literature, is used to focus on tacit knowledge sharing and learning through verbal interaction. The first section looks at the evidence for 'structured talk', which includes the role of argumentation systems on research, problem solving, communication and decision-making. The paper goes on to argue that rural regions have the core competencies needed to cluster but not the interaction. Ensuring appropriate arguments between appropriate people may provide a policy around which to design Internet conferencing infrastructure aimed at enabling the benefits of clustering.

INTRODUCTION

This paper discusses the conceptual basis for a social-technical system aimed at assisting geographically separate companies to use the Internet to achieve the economic benefits of clustering. In Komito's [1998] terms it is about managing a disperse community's knowledge by building knowledge sharing systems for 'wicked unstructured, ill-defined' problems. The knowledge sharing literature, and the evolutionary economics literature, is giving more attention to tacit knowledge sharing and learning through the verbal interaction of group members. This includes Argyris and Schon's [1996] concept of learning or inquiry systems and Lawson's [1999] comments that initiatives follow from dynamic verbal interaction between persons with core competencies.

A lack of verbal interaction between knowledgeable people suffering the tyranny of distance offers new communications technology a chance to overcome the market failure. However, as is now well documented, merely dumping communications technology on people in geographically-disperse areas is not sufficient. Having access to appropriate infrastructure is essential but it may not be sufficient. If an effective system is to be built, then some understanding of how to structure conversations needs to be thought through. Why would talk bring economic benefits? What types of groupings might benefit from more talk? How is the talking to be structured? The example that will be used for illustration purposes is farm and mining companies working in remote regions seeking to cluster to achieve further vertical integration up or down their supply chain. The paper provides a conceptual roadmap of why and how such industries might learn how to develop economically. More specifically this paper argues that:

A well-structured interactive community based discourse (argument/debate) provides a mechanism for an appropriate virtual community to achieve economic development.

The evidence to support this claim will be presented in 5 sections. As the claim is that 'structured talk' will bring outcomes, the first section looks at the evidence for this, which includes the role of argumentation systems on research, problem solving, communication and decision making. This is followed by discussion on how clustering works in the context of the paradox of some management writers calling for geographically-independent organisational structures, while others are calling for physical clustering by core competencies. Next the application of these systems will be considered by first identifying essential attributes for a group likely to be in a position to turn this talking into commercial outcomes. An example using remote rural communities is then given.

Talk for Knowledge Sharing

Nonaka and Takeuchi [1995] have suggested that knowledge can be created through four different modes:

- (1) Socialisation, which involves conversation from tacit knowledge to tacit knowledge,
- (2) Externalisation, which involves conversation from tacit knowledge to explicit knowledge,
- (3) Combination, which involves conversation from explicit knowledge to explicit knowledge, and
- (4) Internalisation, which involves conversation from explicit knowledge to tacit knowledge.

As Argyris and Schon [1996] then point out, merely building databases of existing explicit knowledge may not be sufficient especially in wickedly un-knowledgable domains. Unstructured environments would appear to call for a variety and complexity of re-interpretations of that environment. Hegelian inquiry systems seem more appropriate based upon a synthesis of multiple, diverse and contradictory interpretations allowing continual re-examination of any core rigidities. These systems depend upon dialectical inquiry based on dialogue allowing a free flow of meaning between people. So, in Nonaka and Takeuchi's terms there is a need for all four of their modes, which in turn supports the need for dialectic or argumentative processes to create knowledge.

Speech, which allows complex dialectical inquiry, is a unique human attribute. It is unclear if we are more intelligent than other species, but we do have the advantage of being able to use language to solve our problems. While media richness theory may be an oversimplification, the massive telecommunications industry as a tool of business suggests speech has a dominant place in problem solving, thus knowledge sharing. Indeed, Lievrouw [1998] refers to this as a 'communications ideology', that is; Western culture appears to include a belief that if people can talk then problems can be resolved, even territorial ones. This needs a lot more consideration but suffice to say, not talking seems less likely to solve commercial or technical problems than talking.

Conversation per se may not be useful, a dialectic, and argumentative process is required. Horrocks et al [1999] find that in order to be effective, human interaction needs to be managed and structured. Anyone with organisational experience will know that an interaction with a purpose, agenda, propositions, and delegated actions is more likely to achieve outcomes. Put in more conceptual terms, the management literature reports that having a formalised process of reasoned argument (or debate) has been found to be very effective for large 'wicked' or unstructured, ill defined, problem solving and decision making.

What is a reasoned argument? Argument is the noun of arguing or argumentation, the directed construction of convincing

evidence [see Perelman and Olbrechts-Tyteca, 1969; or Eemeren, Grootendorst and Kruiger, 1987], the argument being the one line claim (conclusion) that is supported by various evidence. The courtroom analogy has been used. Court protocol has also been designed around the open public forum approach suggested by Aristotle. A court case is a research activity; the courts are searching for knowledge, indeed, the truth. Evidence is presented to a universal audience (jury) to convince. In a courtroom, the argument is typically about a person's guilt. In information systems development the argument is more likely to be something like; that system design X is preferable to design Y. It is not possible to say what will be sufficient to convince the audience. Hopefully it is sufficient just to say an argument will be accepted only if the reasons it provides seem plausible, relevant, oriented in favour of the conclusion, and sufficient to support it [Aptheloz, Brandt and Ouïroz, 1993].

Eemeren, Grootendorst and Kruiger [1987] also provide a definition of argument:

Argu[ing] is a social, intellectual, verbal [spoken or written] activity serving to justify or refute an opinion [idea, conception, and policy], consisting of a constellation of statements and directed towards obtaining the approbation of an audience.

Eemeren et al go on to explain their definition. They start by pointing out that arguments are a social activity because there needs to be two people present, with two worldviews. This is very relevant here because the argument approach, the dialectic, is gaining consensus from differing views to the extent that Crosswhite [1996] sees reasoned and structured argument as a means to avoid hostile conflict. So argument is an intellectual activity, 'an activity of reason' where emotion (aggressive or tearful) is 'subordinate to that of reason'. Eemeren et al contrasts this with hierarchical communication, so typical of commercial organisations. It addresses the power issues. The cornerstone of the courtroom system is that there should be little room for bullying to hide evidence. So, the act of professional arguing should align itself with the accepted ethos of scientific decision making.

Reasoned argument always refers to a particular subject upon which opinions can and do differ and so is particularly relevant to human inquiry or scientific research. It is a scholarly means of collecting and creating human knowledge. Eemeren, Grootendorst and Kruiger [1987] go so far as to say any topic, without any exception, may be the subject of argument. Yet, arguing requires the use of language.

They continue that arguing is offering, defending against, taking account of, and anticipating criticism. It consists of a constellation of one or more statements. The common feature to both pro arguments and contra arguments is that both forms are directed towards testing opinion.

Ziegelmueller and Dause [1975] agree that research and convincing are the cornerstones of good argument. They point out that logical articulation or intellectual cohesion that makes an argument tight comes from thought and not from the mere recitation of the facts or instances. They also put this the other way around:

Research skills stand at the very heart of the inquiry phase of argu[ing].

Both in the sense of providing good information for making decisions, and for assisting with the act of actually making the decisions, setting up a well managed process of argumentation

research appears to have a philosophical basis and is integrated with the best scientific methodology.

The Problem Solving Literature

There is also extensive management literature on the use of argument in both problem formulation and decision making. For example, Niederman and DeSanctis [1995] report that,

"the structured argument approach led to a greater combination of both coverage of critical issues and consensus... Use of the structured argument approach also resulted in higher satisfaction with the problem definition and commitment to implementing results..."

Meyers and Seibold [1989] provide an extensive review of the use of argument in decision-making literature.

"...investigators have studied whether utilising structured argument formats (i.e. devils advocate or planned dialectic enquiry) contributes to higher quality decisions. Results have indicated that utilisation of both ... are useful for surfacing assumptions and evaluating crucial information in uncertain and ill-structured decision-making situations."

They go on to say, "arguments are both the medium and outcome of group interaction" [Myers & Seibold, 1989]. Making arguments both systems (observed patterns of interaction) and structures (the unobservable generative rules and resources that enable argument). This links into the structuration perspective derived from Giddens' [1984] theory, with a culturally appropriate and sanctioned way of disputing. Meyers and Seibold [1989] go on to align argument with Giddens' Theory, saying that argument provides the interaction system (in Giddens' sense) to make a structure. In this paper, this is applied saying argument can also be used to consolidate a computer based organisational information system. The managerial task is to manage this argumentative process so that individual managers' private agendas, emotions and power needs are held in perspective, while allowing innovation and reflection [Schon, 1983].

Meyers and Seibold [1989] summarise the extensive empirical research on analysing argumentative processes aimed at reaching a consensus in decision making. To date, much of this research has been done using the positivist methods such as quantifying individual and group interactions and trying to predict the decision outcome. However, Fischer and Forrester [1993] report on more interpretive research on the role of argument in Government policy formulation. At one stage they equate the argumentative literature with story telling research methods.

Decisions need to be communicated, and preferably enacted by those involved in the communication. In order to effectively design and implement an Information System (IS), especially with respect to senior management, it is necessary for them to be committed (internalised). The argumentation approach offers this opportunity. Users are more likely to be committed to a new design if they have been involved in an argumentative process that was seen to be reasonable. If nothing else, the advantages, purpose and context of the new system will be better communicated. The management literature supporting the role of argument to assist communications is even more extensive than the decision-making literature

"From its beginnings in late nineteenth-century forensics pedagogy, the study of argument has been a rich intellectual tradition in the field of communication." [Meyers and Seibold, 1989]

A further attraction of the argument approach is that it makes no pretence of impartiality. Pretending to be impartial about the alternatives does not work in scientific inquiry [Broad and Wane, 1982] and causes offence in the political hierarchies of modern organisational life. Much time and emotion is saved if each actor openly states their preference, or claim, up-front rather than pretending to present impartial questions. Crosswhite [1996] argues that this aligns with human development where claims are learnt before the skill to question.

ESSENTIAL ATTRIBUTES

Moving on now to consider a virtual application of structured talking. Jones [1995] argues that virtual groups usually fail to achieve solidarity. He attributes this to the ease, with which people can enter and leave a group, and the ease with which new groups can form. Lehman [1999] argues that a successful group needs to agree on their essential purpose, to care about the same things with the same priority. Problems in doing this is expected to lead to tensions within the group that unless minimised will destroy the community. Lehman [1999] continues that any group needs to determine what is significant, such as achieving the correct balance between working to increase their wealth and their needs for leisure time. It is important that any group that wishes to become dependent on each other economically settles these issues. This is particularly true of virtual groups, as membership has to be constantly reasserted by logging-on to the group. In contrast geographically located groups have to make considerable effort to leave that group.

Komito [1998] identifies different types of groups, and lists them as:

- Moral: with a common purpose of caring e.g. a family.
- Normative: with a common purpose of agreed rules of practice e.g. work.
- Practice: with a common purpose of sharing common experiences e.g. scientists, miners or farmers.
- Proximate: with a common purpose of maintenance of a lifestyle based on a geographical location, it is assumed this includes defence e.g. a nation or neighbourhood.
- Foraging: with a common purpose of independence, non-commitment, raising the question if all web users are foragers, not looking for solidarity.

These vary in terms of their focus on seeking outcomes. While not mentioned by Komito [1998] it is also possible to view this list as the requirements for any group of persons that wish to achieve some purpose such as clustering for economic gain.

- Moral: the companies involved in a clustering exercise will need to care, maybe only for each other in terms of being mutually dependent, but also would need to care about economic growth.
- Normative: once remote industries had made contact there would inevitably follow some need for rules of interaction, from ethical behaviour rules to rules of correspondence.
- Practice: this characteristic needs little reflection, 'with a common purpose of sharing common experiences eg: scientists, miners or farmers'. Later, the centrality of sharing to clustering will be further explored.
- Proximate: rather than be thought of merely needing geographical locality, it can be interpreted as the need for effective communication.

- Foraging: this could be interpreted in two ways, first, in order to be effective, a cluster of companies may most usefully not be too rigid in its organisation of who speaks to whom, about what, and in controlling what activity follows from those discussions. Second, in order to learn and grow clustered companies may need to spend some time and effort in individually undertaking market and product research and reporting back to the cluster. This can be thought of as foraging.

The question for this paper is do any of these appear impossible for virtual organisations?

An Example - Remote Rural Communities

Most of virtual organisation depend on communication so, provided the technology does deliver the most appropriate communication, then reflection of the list above does not appear to bar virtual communities from achieving outcomes.

For example can remote farming and mining companies form a virtual cluster? Cothrel and Williams [1999] list some preliminary criteria to help "set realistic expectations about what a particular on-line group can hope to achieve". While rather naive, the list does provide a forum for considering whether remote rural companies are likely to form an effective virtual cluster.

(1) Are members relatively isolated from one another? This can spur the need for on-line interaction.

This statement rather supports the argument that virtual communities exist and can be created by suggesting *members* can be isolated. However, the farm and mining companies in remote regions clearly passes this test by definition.

(2) Do members share information among themselves already?

Clearly farming co-operatives and explorer partnerships are common place. Both keep public records of prices and other market data and Governments insist that other information is shared such as explorers geological findings. Naturally, there are some things that are 'commercial-in-confidence' so any communications system between members would need to recognise this.

(3) Do members need information to do their work?

It is assumed this means 'from each other', which then seems like a very relevant issue. It helps if there is a reason why members **need** to talk to each other. However, a thesis that structured conversation can lead to innovation departs from the 'needs' approach. The attraction of the idea that structured conversation leads to idea generation does not clash with the 'need to talk' view, but rather is dealing with a different part of the idea creation and implementation cycle. This issue will be re-visited in the final section.

(4) Do [opinion leaders] support the idea of on-line collaboration?

The issue of opinion leaders seems important. However, in Australia the explorer and farming industry is made up of a large number of relatively small, owner-managed, companies. This has led to a very competitive, highly innovative industry, which is less influenced by one or two dominant opinion leaders than say the automobile industry. Yet, one aspect of providing a well-structured conversation is to include persons with respected reputations. This is not an appeal to authority but rather an acknowledgment of experience and expertise [Walton, 1998].

(5) *Is the subject of their work or common interest something they can be passionate about?*

Given the comments above about 'common purpose' this question again raises some important issues. Given the economic decline in remote Australian regions, which separates family and destroys towns, coupled with a general desire for an improved lifestyle, it is being assumed that miners and farmers will be passionate about economic development [see Linn, 1999].

Core Competencies

The recent economic literature advises that an appropriate community for economic development is a cluster based on core competencies. Exactly what constitutes core competency is unclear. Lawson [1999] reviews the literature, trying to separate out various 'knowledge levels'. Immediate product knowledge is thought to be too specific, to be classed as a core competency, it involves knowledge at a more general level involving "technological spillovers, conventions, rules and languages for developing, communicating and interpreting knowledge, etc. plus common understanding which makes up the cultural, socio-economic industrial atmosphere" [Lawson, 1999]. To this he adds the ability to innovate, or 'collective learning', defined as "the creation and further development of a base of common or shared knowledge among the individuals within a productive system, allowing for the coordination of action and the resolution of problems" [Lawson, 1999]. Lawson goes on to argue that this is learnt from social interaction and learning by doing in a group, which facilitates knowledge flows, allowing unplanned, synergistic, expertise-mixing.

So, do the rural regions have the core competencies to cluster? Given that they are relatively successful and experienced in 'the farming industry' and 'the mining industry' it would seem they are competent in something. However, few are in the innovation industry. Knowledge of crop alternatives and customer tastes may be missing. The traditional focus of farmers was on cost, quality and quantity of a standard product. As Lawson [1999] summarises, effective clustering requires a core competency concentrating upon solving problems for customers, in the case of farmers that is innovation in food on the plate. An example, often mentioned in farming groups, is that farmers know how to make a product but they have little contact with the distribution and retail customer's issues.

It would, therefore, seem that successful clustering is about getting people with a wide range of technical and commercial knowledge talking to each other, but particularly those who really do understand customers' most urgent concerns. Lawson [1999] feels that the electronic industry has been very good at this thus clustering of these firms have been very successful. This of course is the same advice as saying networking with customers is important. Modern commerce requires the skills of a range of people. One-person alone can rarely cover all the design, production, distribution, financial and customer knowledge required.

An alternative way of looking at 'appropriateness' of organisations is from a critical theory perspective. Therborn [1996] summarises this as including asking how some human foible has turned into organisations, assumably because of their being a herd animal. There may be two inter-related foibles here. First, humans as problem solvers, and second, this being made so effective by language. The herding (community) and language part can also be approached from the communitarian perspective of the self derived from community interaction [see Taylor in Lehman 1999], well critiqued by Lehman [1999], which is something Liberalism

sometimes forgets. The language and problem solving aspects are typified by the observation that the most useful problem-solving piece of IT is the mobile phone. So, if a group of humans have a common problem, and can talk about it, an effective community is expected to follow. The last foible that suggests the development of the entire communications industry is that of the tyranny of distance. The very presence of the communications technologies of writing, printing, flag signalling, telegraph, telephone and the internet, suggest a problem being solved. The problem being distance. Suggesting that any communications technology that shortens the distance between people, while maintaining their privacy, will continue to solve this problem.

Argument would thus seem to be useful method for inquiry, problem solving and decisions making, all attributers of knowledge sharing. Above, it was said that clustering required appropriate conversation between persons with core competency. Ensuring appropriate arguments between appropriate people may then provide a policy around which to design Internet conferencing infrastructure. The problem then becomes how to manage these arguments

CONCLUSION

This paper has argued that knowledge sharing requires a dialectic inquiry process that allows tacit knowledge to pass between people with core competencies. Typically this process involves setting in place infrastructure to allow the time-honoured method of well-structured argument (debate) to take place between people with core competencies. In this way clustering of remote rural industries may be effective. That rural communities can cluster was discussed, pointing out that they easily passed the criteria for successful on-line groups.

The extensive management literature that has found argument and debate so effective in innovation, problem solving and decision making provides a pragmatic justification for looking to talk for effective clustering. Clearly, out of sight debate does exist at present. The next stage is to package it so as to extend its impact. Managing the debates will be an important management-system development to provide real economic benefit.

REFERENCES

- Argyris, C and Schon, D A (1996) *Organizational Theory 2: Theory, method, and practice*, New York: Addison-Wesely, New York.
- Apotheloz, D; Brandt, P and Ouiroz, G (1993) "The Function of Negation in Argumentation", *Journal of Pragmatics*, Vol. 19, pp. 23-39.
- Broad, W and Wane, N (1982), *Betrayers of the Truth*, New York: Simon and Schuster.
- Cothrel, J and Williams, R L (1999), "On line Communities: helping them grow", *Journal of Knowledge Management*, Vol.3, No.1, pp. 54-60.
- Crosswhite, J (1996), *The Rhetoric of Reason*, Madison, Wis.: University of Wisconsin Press.
- Eemeren, F H; Grootendorst, R and Kruijer, T (1987), *Handbook of Argumentation Theory*, Dordrecht: Foris Publications.
- Fischer, F and Forrester, F (1993), *The Argumentative Turn*, NC: Duke University Press.
- Foo, S and Hui, S C (1998), "A Framework for Evaluating Internet Telephony Systems", *Internet Research*, Vol.8, No.2, pp. 14-25.
- Giddens, A (1984), *The Constitution of Society*, University of Cali-

- ifornia Press.
- Horrocks, S; Rahmati, N and Robbins-Jones, T J (1999), "The development and Use of a Framework for Categorising Acts of Collaborative Work", *Proceedings of the 32nd Hawaii International Conference on System Sciences*, USA: IEEE Computer Society.
- Komito, L (1998), "The Net as a Foraging Society: Flexible Communities", *Information Society*, Vol. 23, pp. 151-166.
- Jones, S G (1995), *Cybersociety*, California: Sage.
- Lawson, C (1999), "Towards a competency theory of a region", *Cambridge Journal of Economics*, Vol. 23, pp 151-166.
- Lehman, G (1999), "Chapter 1: Communitarianism", *Liberalism versus Communitarianism*, Flinders University: PhD Thesis in Progress.
- Lievrouw, L A (1998), "Our Own Devices", *Information Society*, Vol. 14, No.2, pp. 83-96.
- Linn, R (1999), *Battling the Land: 200 Years of Rural Australia*, Sydney: Allen & Unwin.
- Metcalfe, M (1995), "Decision Making in Small Groups", *International Journal of Computer and Engineering Management*, Vol.3, No.1, pp. 40-54.
- Myers, R A and Seibold, D R (1989), "Perspectives on group argument", *Communications Yearbook*, Vol. 14, pp. 268-302.
- Niederman, F and Desantis, G (1995), "The Impact of the Structured Argument Approach on Group Problem Formulation" *Decision Sciences*, Vol.26, No.4, pp. 83-96.
- Nonaka, I and Takeuchi, H (1995), *The Knowledge Creating Company*, New York: Oxford University Press.
- Perelman, C H and Olbrechts-Tyteca L (1969) *The New Rhetoric: A treatise on argumentation*, Notre Dame, Ind.: University of Notre Dame Press.
- Schon, D (1983), *The Reflective Practitioner*, New York: Basic Books.
- Taylor cited in Lehman, G (1999), "Chapter 1: Communitarianism", *Liberalism versus Communitarianism*, Flinders University: PhD Thesis in Progress.
- Therborn, G (1996), Chapter 2: "Critical Theory", In *Social Theory*, B S Turner (ed.), Mass: Blackwells.
- Walton, D (1998), *The New Dialectic*, Toronto: Toronto University Press.
- Ziegelmüller, G W and Dause, C A (1975), *Argumentation: inquiry and advocacy*, New Jersey: Prentice Hall.

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