

Graham Orange, [Mike Cushman](#) and Alan Burke COLA: a cross organisational learning approach within UK industry

Conference paper

Original citation:

Originally presented at: 4th international conference on networking entities (Neties'99), 18-19 March 1999, [Donau-Universität](#), Krems, Austria.

This version available at: <http://eprints.lse.ac.uk/24781/>

Available in LSE Research Online: August 2009

© 1999 Graham Orange, Mike Cushman and Alan Burke

LSE has developed LSE Research Online so that users may access research output of the School. Copyright © and Moral Rights for the papers on this site are retained by the individual authors and/or other copyright owners. Users may download and/or print one copy of any article(s) in LSE Research Online to facilitate their private study or for non-commercial research. You may not engage in further distribution of the material or use it for any profit-making activities or any commercial gain. You may freely distribute the URL (<http://eprints.lse.ac.uk>) of the LSE Research Online website.

COLA: A Cross Organisational Learning Approach within UK Industry

Graham Orange

School of Information Management, Leeds Metropolitan University
The Grange, Beckett Park
Leeds LS6 3QS, England
g.orange@lmu.ac.uk
Phone/fax: +44 113 283 3240

Mike Cushman

Information Systems Department, London School of Economics
Houghton Street, London WC2A 2AE
m.cushman@lse.ac.uk
Phone: +44 171 955 7426
Fax: +44 171 955 7385

Alan Burke

School of Information Management, Leeds Metropolitan University
The Grange, Beckett Park
Leeds LS6 3QS, England
a.burke@lmu.ac.uk
Phone/fax: +44 113 283 3240

More information on COLA may be found at <http://is.lse.ac.uk/b-hive>

"The construction industry struggles with its ability to capture the 'lessons learned' from its projects and activities for the benefit of future, similar work".
(Fisher, 1998)

Introduction

In this paper we set out to describe some of the findings of the B-Hive (Building a High Value Construction Environment) research project. The project has been jointly funded by the Engineering and Physical Sciences Research Council (EPSRC) and the Department for the Environment, Trade and the Regions (DETR). Our research, centred on the construction industry, seeks to integrate cross organisational functions and build an environment of trust and co-operation between the collaborating companies through the implementation of new working processes and practices supported by the introduction of information systems and technology.

The project involved: two major construction clients, a privatised utility company and a major leisure services provider a large construction company ; two leading construction consultancy firms; and London School of Economics and Leeds Metropolitan University.

The project has conceived its approach to these issues as designing and implementing a COLA (Cross Organisational Learning Approach). Through a process of reflection

and discussion COLA facilitates processes for review, learning and knowledge generation, and is supported by information systems that inform these processes.

Knowledge and organisational learning through reflection

"Knowledge is the state or fact of knowing; it is understanding gained through experience or study; the sum or range of what has been perceived, discovered or learned" (Snyder and Wilson, 1998) and may be seen as either explicit or implicit. Explicit knowledge is that which is readily structured and may be stored in a number of repositories e.g. databases, spreadsheets, architects drawings, libraries etc. and imparted through the use of traditional learning methods (Snyder and Wilson, 1998).

Implicit knowledge (also known as tacit knowledge) is that which is stored in peoples' heads and is often communicated informally and is often the most valuable to an organisation. It is personal, being based on an individual's perceptions, values and intuition and is a significant part of the knowledge which defines an individual as an 'expert'. As such it is more difficult to formalise and record. However, B-hive is concerned with providing a means by which this type of knowledge can be exchanged and, indeed, created through the process of reflection and discussion facilitated by the COLA review process. An IT based system has been developed to support this process and to record and disseminate appropriate forms of the learning which results from the review.

Explicit knowledge has a role in the learning process and contributes to the individual's armoury required for his/her effectiveness within the organisation. However this alone is insufficient, business decisions made are based on judgement, expertise, values and perceptions, that is, tacit knowledge. The COLA process facilitates project team members to uncover their own personal theories and make them explicit (Day, 1993).

Day (1993) considers reflection and identifies a number of assumptions:

- Engaging in reflective practice involves a process of solving problems and reconstructing meaning.
- Reflective practice is manifested as a stance towards inquiry.
- The demonstration of reflective practice is seen to exist along a continuum or 'reflective spectrum'. That is, it reflects different stages of development of the individual on a scale from non-reflective to reflective.
- Reflective practice occurs within a social context. COLA provides this social context within its workshops.

Day states that individuals spend most of their time planning and acting and much less on observation and reflection and even less on justification of their actions. Reflection necessitates translating public theories into personal ones and vice versa through the adoption of the 'five level' model of reflective practice (Griffiths and Tann in Day, 1993):

1. Rapid reaction (instinctive, immediate).
2. Repair (habitual, pause for thought, fast, on the spot).
3. Review (time-out to reassess, over hours or days).
4. Research (systematic, sharply focussed, over weeks or months).

5. Re-theorise and re-formulate (abstract, rigorous, clearly formulated, over months or years).

This is valid as far as it goes. The model thus stated implies a linear process though the process ought to be seen as iterative enabling tacit knowledge to become explicit at each iteration progressively refining and enhancing the individual's knowledge and expertise. There needs to be a further step of the integration of the learning into the individual's tacit model of the world before it is fully usable as expertise in future projects. Providing a higher level of learning and reflection which will take place by capturing recurrent issues and problems. Strategic decisions involving objective setting, training and process redesign may be required if recurrent patterns emerge in the issues considered in project reviews.

So far reflective practice has only been discussed within the context of the individual. However, reflection, is not an individual process, it can be seen as a social process (Elton et. al., 1989; Day, 1993). It is

“...a form of self reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own practices, their understanding of those practices, and the situations in which those practices are carried out”.

(Carr and Kemmis, 1986 in Schratz, 1993, p115)

A primary function of COLA is to provide a review process forum for the social construction of knowledge. This kind of knowledge may not already exist since it is concerned with the alignment of norms and values within the group; the group needs to establish what can be reasonably expected from each of its members. This knowledge is socially constructed because it is established through discussion and reflection upon past experience and future expectations. Such knowledge, when it is generated, does not belong to an individual but can be seen to exist collectively within the group and it is subject to constant renegotiation.

Reflective practice can have benefits for the organisation as a whole since it contributes to individual learning and, when seen as a social process, it contributes to organisational learning. Individual learning on its own is not sufficient (Jones et. al., 1998) for the organisation to maximise the benefits to be gained from reflection. Individuals move around the organisation from team to team. They do not necessarily share their knowledge and experience with colleagues because the mechanisms do not exist to support sharing, or perhaps they just do not know how, or culture does not facilitate sharing. One of the main problems in the construction industry is the transitive nature of project team membership. A project team is an amoeba-like entity that shifts in size and composition during the lifecycle of the project. Medium and large scale construction projects are delivered through Temporary Multiple Organisations (TMOs) (Cherns and Bryant 1984) involving the client and a number of other organisations such as, main contractor, architect, designers, project manager, quantity surveyors and specialist sub-contractors. The membership of the TMO will often change during the life of a large project and the representatives of each organisation on the project may change leading to the dissipation of collective and individual knowledge and the collapse of the social networks which supported the knowledge and gave it significance. It becomes “hidden in filing cabinets, in peoples

heads, discussed covertly over the coffee machine or, indeed, forgotten” (Pedler et al., 1996). Worse still people may leave the company carrying with them important information, which becomes lost to the organisation (Argyris and Schön, 1987).

Successful organisational learning within this context is dependent on fostering an environment of collaboration. Day (1993) argues that collaborative cultures, contract-making, entitlements and critical friendships built through openness and trust encourage team members to share problems and respond to new demands, reinforcing a sense of autonomy with responsibility by affirming confidence in each other. COLA can be seen as an important element in producing a culture which recognises the importance of both collaboration and reflection.

The COLA environment

The related issues of difficulty that clients have in expressing their needs in ways that construction companies can meet efficiently and effectively, that clients have in gaining value from their construction investment, and the lack of learning across contractual boundaries have been the subject of a series of reports of which the Government commissioned Latham Report (Latham 1994) has been the most significant.

The B-Hive project identified the problems confronting the construction industry as complex, with different participants holding both different understandings of the issues and having often competing goals and where there are no certain and agreed measures of inputs, processes and outputs. They were seen to be, in the terms of Rittel and Webber (1973), *wicked* rather than *tame* problems. The set of approaches and methodologies constituting *problem structuring methods* (Rosenhead 1989) were adopted both as tools for the academic/industry team to agree on their approach and, later as part of the interventions themselves. An exercise using Strategic Options Development and Analysis (SODA) (Eden, *et al.* 1979) led to the identification of the issues of post-completion review in the leisure company and the Management of Project Changes in the utility company, as key aspects of the process where unexploited opportunities for learning were being created in a partnering and value sharing environment. B-Hive has run one-day post-completion review workshops with the leisure company. The first two, exploratory, post-completion workshops were run on the basis of value engineering techniques (Connaughton and Green 1996) drawing on the experience that the leisure company’s representative had in applying this technique. A major constraint on designing a workshop process for project review is the availability of staff and the length of time that they are willing to spend at a workshop. The experience of the exploratory workshops indicated that attention had to be paid to pre-workshop activities and to move some activities that are normally carried out within a workshop to the pre-workshop phase.

These considerations led to the development of a process model (figure 1). This was an attempt to identify processes to assist in project review in order to: promote the sharing of knowledge across organisational boundaries; and identify the rôle that information systems can play in supporting the process. It also played a major rôle as a communication tool to build consensus amongst the B-Hive project team and to inform other workshop members about the process. The model enabled a dialogue

between project members about the status of organisational knowledge and learning and through debates about the concept of a bank of acquired knowledge, the acceptance of the notion of tacit knowledge (Polanyi 1967). This also enabled an approach that placed emphasis on managers' understanding and interpretations of the world in which they work as a basis for moving towards action. (Introna 1997).

The COLA review process records and monitor key issues, decisions and actions surrounding these key issues ensuring that implicit learning is not lost on completion of the construction project. The term 'review process' is used which allows of a deal of flexibility in that many different procedures may be performed for a review e.g. workshop, meeting, teleconference, videoconference, etc. or any combination of these.

There are many situations that may necessitate the review process being triggered, for example:

- Programmed Review
 - Post Completion, leading to a review where the scope encompasses the construction project as a whole.
 - Stage Completion, scoped for a particular stage of the construction process.
 - Time based e.g. period end, monthly etc.
- Non-programmed Review
 - Issue Resolution, necessitating a review to address a particular problem of high priority, for example running late or over budget or perhaps a technical difficulty.
 - Innovation, where a team has been innovative either in process or use of materials this experience should not be lost.

However all reviews facilitate critical reflection on past activities, focussing on individual and organisation learning and allows changing future actions to increase value to all participants

Within B-Hive we have developed the information systems required to support the COLA workshops,

Supporting Information Systems

The information system supports both pre and post workshop activities. Pre-workshop information is requested (via questionnaire) to identify major problems and issues throughout the lifecycle of the construction project. Currently the questionnaire is circulated to project team members representing, where possible, all organisations of the partnership.

As a result of this data collection exercise problems and issues are collated, categorised and prioritised ensuring that only those perceived to be of major importance by the participants are presented for consideration in the workshop. During the workshop actions, decisions and responsibilities are assigned and recorded against each problem or issue. The information system will monitor the performance and value of decisions made and actions taken. This information is held on a

Microsoft Access database for demonstration purposes. It is envisaged that the working implementation will be written using the existing architecture of the organisation(s).

The database holds the descriptive information on the problems and issues. Each will have supporting historical data dispersed throughout the partner organisations held in many formats such as word-processed documents, spreadsheets, databases, drawings etc. Where feasible, there will be links between the data held on the COLA project review database and these supporting files and access will be via an extranet.

The COLA information system is not perceived as consisting solely of the Access database system. The primary function of the database system is to capture and process data centred on the review process, for example:

- Pre-review event – trigger and issue data. The system holds data on construction projects and partnerships. It also captures data on events that may trigger a reflective review, for example the end of a construction stage or post completion or a significant issue (this may be as a result of a major problem or perhaps where a course of action has resulted in a positive impact and the partnership do not want to lose the associated knowledge). The system facilitates the classification and prioritisation of the issues prior to the review so that a focus is maintained.
- Review – decisions and actions. Major decisions, actions and responsibilities from both the historical perspectives in terms of the construction project and those defined in the review event are captured.
- Post-review event – performance monitoring. The effectiveness of decisions and actions taken is monitored to assess any value improvements resulting from the review process.

In addition to the data stored on the database there will be much relevant data stored in many different formats (word-processed, spreadsheets, other databases etc.) in many different locations across all of the partnership organisations. Such data is important to support context setting, the prioritisation process, contact information, costings etc. Where relevant there will be active links between the COLA system and supporting files and documents.

It is the intention that the COLA information system will reside in an extranet environment from where it is accessible to all partner organisations. Conversely relevant files and documents held on computer systems within partner organisations are accessible from the COLA IS (see figure 2).

Issues surrounding the Information Systems Implementation

Development of the information system is technically feasible. The technology exists to enable computer communication between partner organisations. The real barriers to implementation are much ‘softer’: they are cultural. Suddenly we are placing organisations that are traditionally very protective of their data in a position where they are to give open access, to others, to parts of their systems. This raises the following issues.

Ownership: This is a very complex issue raising many questions. The system will be accessed by many organisations; who owns the system? Who owns the data? Who supplies the management infrastructure? Who supplies the technical infrastructure? Where will it be located? What security measures are required?

Group Dynamics: What happens when there are personnel changes? What happens when an organisation leaves the partnership or a new one enters? What impact does this have on ownership and access to the system?

Culture: Members will move from a situation where information is currently presented to them to a situation where they will have to extract their own information by interrogating the extranet. Will there be acceptance of shared data, shared ownership, shared responsibilities?

The development of COLA will allow these softer issues to be explored after the completion of the B-Hive project. The project has laid the necessary groundwork for the long term exploration of these crucial issues. There is willingness for all partner organisations of the construction projects under review to participate in the COLA process. Workshops have been positive in that participants are not defensive and each perceives the benefits of open discussion of key issues. The challenge now is to reach beyond the workshops and into the individual organisations creating an environment of shared data.

Summary

The B-hive project has concerned itself with one aspect of organisational learning: using a review procedure for construction projects to analyse the processes that have taken place so that lessons can be learned and acted upon. A technical and social environment is being provided so that implicit learning may be recorded and made available for future projects.

Figure 1.

The COLA Review Process

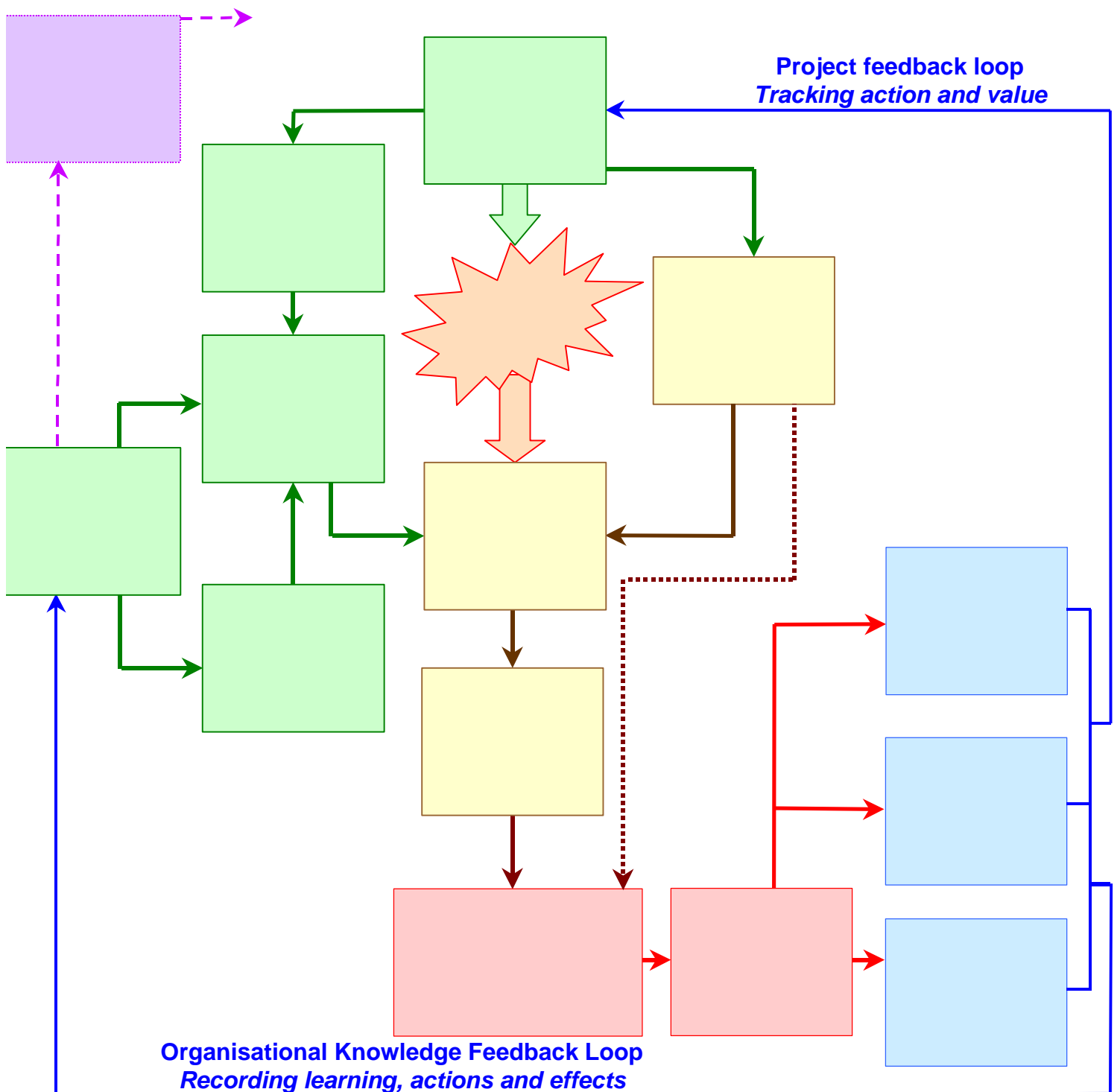
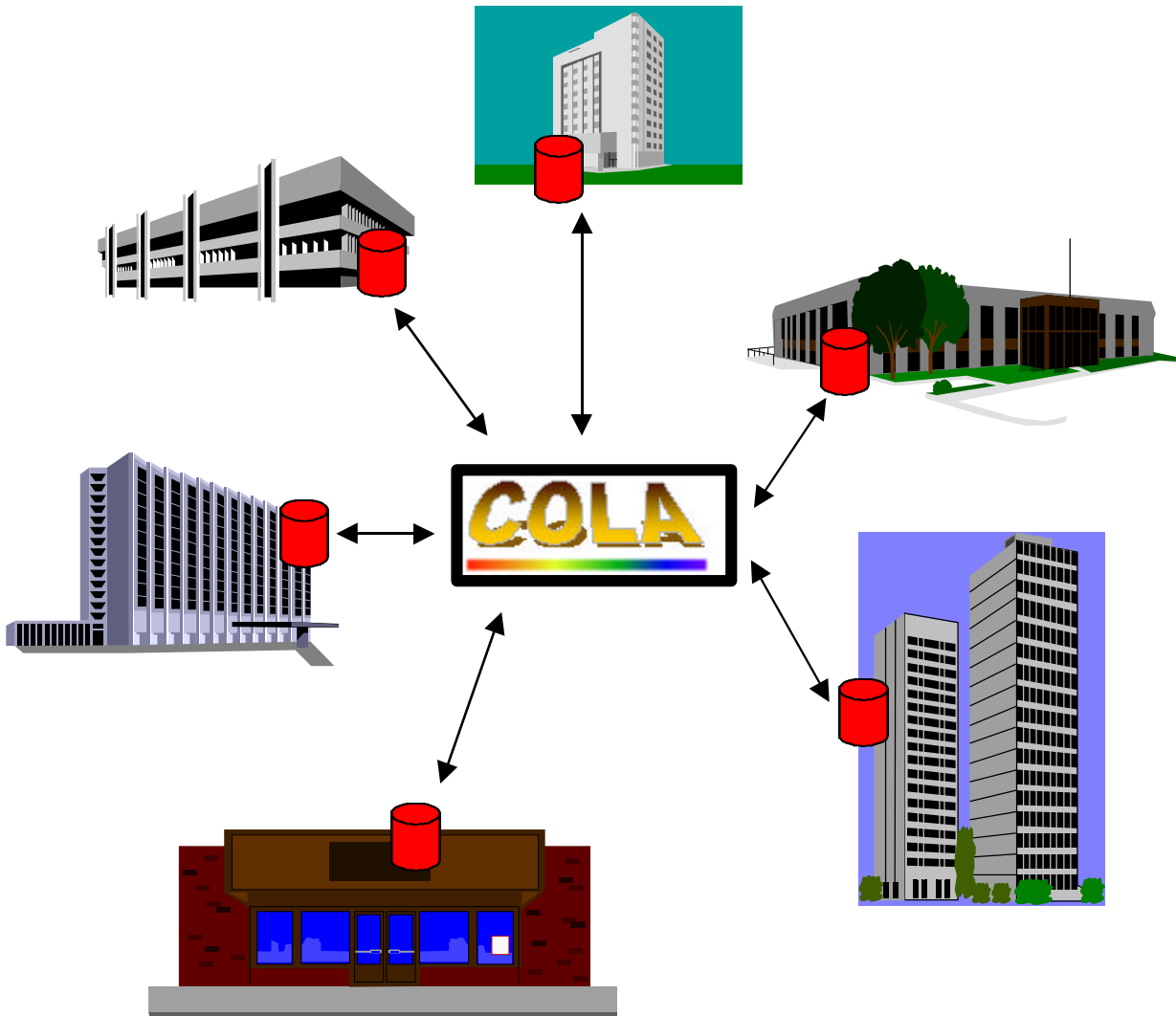


Figure 2



References:

- Argyris C. and Schön D., (1987); "What is an Organization that it may Learn?" in Paton R., Brown S., Spear R., Chapman J., Floyd M., Hamwee J. (eds.) (1987); *Organizations: Cases, Issues, Concepts*
- Cherns A. and D. Bryant (1984) Studying the Client's Role in Construction Management. *Construction Management Economics* 2,177-184.
- Connaughton J. N. and S. D. Green (1996) *A Client's Guide to Value Management in Construction*. CIRIA, London.
- Day C., (1993); Reflection: a necessary but not sufficient condition for professional development; *British Educational Research Journal*; Vol. 19, No. 1
- Eden C., S. Jones and D. Sims (1979) *Thinking in Organizations*. Macmillan, London.
- Fisher D. J., (1998); The Knowledge Process, in *Lean Construction* ISBN 9054106489
- Introna L. (1997) *Management, Information and Power*. Macmillan, Basingstoke.
- Jones M. and Saad M., (1998); Loop the loop to get ahead - Organisational learning as a tool to manage change; *Project*, June
- Latham S. M. (1994) *Constructing the Team: Final Report of the Government/Industry Review of Procurement and Contractual Arrangements in the UK Construction Industry*. HMSO, London.
- Pedler M., Burgoyne J., Boydell T. (1996); *The Learning Company: A Strategy for Sustainable Development*, McGraw-Hill
- Polanyi M. (1967) *The Tacit Dimension*. Routledge and Kegan Paul, London.
- Rittle H. W. J. and M. M. Webber (1973) Dilemmas in a General Theory of Planning. *Policy Science* 4,155-169.
- Rosenhead J. (1989) *Rational Analysis for a Problematic World: Problem Structuring Methods for Complexity, Uncertainty and Conflict*. Wiley, Chichester.
- Schatz M.; (1993); Researching While Teaching: promoting reflective professionalism in higher education; *Educational Action Research* Vol. 1, No. 1
- Snyder C. A., Wilson L. T.; (1998); The Process of Knowledge Harvesting: The key to knowledge Management, *proceedings of BIT 98* held at Manchester Metropolitan University, November 1998.