Engineering, Construction and Architectural Management 2002 9 | **1**, 2–15

A model for supporting inter-organizational relations in the supply chain

PETER E. D. LOVE*, ZAHIR IRANI†, EDDIE CHENG‡ & HENG LI‡

**School of Management Information Systems, Edith Cowan University, Churchlands, Perth, WA, Australia, †Department of Information Systems and Computing, Brunel University, Uxbridge, Middlesex, UK, and ‡Department of Building and Real Estate, Hong Kong Polytechnic University, Kowloon, Hung Hom, Hong Kong*

Abstract The construction industry is highly fragmented and adversarial in nature, which has resulted in it being criticized for its poor project performance and lack of innovation. To improve performance, particularly inter-organizational relations, organizations need to consider the formation of alliances with their project partners. Some construction organ- izations are beginning to initiate short-term alliances with their customers and suppliers as part of a supply chain management strategy. However, such short-term alliances inhibit feedback, which in turn supports learning and the development of mutual trust and cooperation. It is proffered that construction organizations should consider developing long-term alliances, so as to enable parties to form learning alliances. The implications of forming different types of strategic alliances/partnering in construction are discussed. An inter-organizational model that can be used to support learning and is founded on the principles of total quality management (TQM) is described. A case study is used to demonstrate that cooperative relationships can be used to cultivate a culture for reflective learning and mutual trust, beyond merely project-specific performance improvements.

Keywords construction, learning, partnering, strategic alliances, total quality management (TQM)

INTRODUCTION

To acquire a competitive advantage many organizations, such as those in manufacturing have formed alliances with other organizations as part of a strategy to enhance their production processes and service delivery (Bronder & Pritzl, 1992). Pursuant to the manufacturing industry, which incidentally has taken the lead in developing closer business relationships with customers and suppliers, the construction industry as a specific form of manufacturing, has also embraced strategic alliances. Instead of using the term *strategic alliance*, the construction field refers to such a close relationship as *partnering* (CII, 1991; CIB, 1997; Barlow *et al.*, 1997; Holt *et al.*, 2000).

As strategic alliances have become an important means of survival for organizations operating in the manufacturing industry, several theories for improving inter-organizational relations have been proposed during the past decade (e.g. Lindsay, 1989; Spekman & Sawhney, 1990; Wood & Gray, 1991). Similarly, research on partnering in construction has been ubiquitous (Abudayyeh, 1994; Larson, 1995; Matthews *et al.*, 1996; Brooke & Litwin, 1997; Cheng *et al.*, 2000; Li *et al.*, 2000). As these two terms are often seen as being synonymous (Cheng *et al.*, 2000), it is suggested in this paper that further effort should be put to relate the relevant literature in the two, but with different work practice areas (construction and manufacturing). According to Cheng *et al.* (2000) strategic alliances can improve project performance (in terms of cost effectiveness and improved quality), and overall customer–supplier satisfaction. When forming a strategic alliance, construction organizations should be aware of the following changes that may be imposed on their organization (Holt *et al.*, 2000; Li *et al.*, 2000):

- self-governance (i.e. understanding its own capabilities relative to demand);
- responsiveness (i.e. able to recognize those changes in demand that will have an adverse impact on its operations as soon as possible); and
- flexibility (i.e. able to respond to changes in customer needs and demands).

In order to address these demands effectively, construction organizations should pay attention to the factors that affect the effectiveness of their operations. Despite the dominant perception that the above demands are primarily influenced by exogenous variables such as economic factors and the market

environment, striving to become learning organizations is considered to be a survival tactic for many organizations (Ford *et al.*, 2000; Holt *et al.*, 2000; Love *et al.*, 2000a, b). According to Borzsony & Hunter (1996), a learning organization should recognize the needs for changing the way it conducts its business and has the ability to change. In fact, the key to strategic alliances lies with the ability of construction organizations to form 'learning alliances' (Morrison & Mezentseff, 1997; Holt *et al.*, 2000). Many construction organizations are, however, often left in the quandary on how best to strive to become a true learning organization (DeVilbiss & Leonard, 2000; Ford *et al.*, 2000; French & DeVilbiss, 2000; Knuf, 2000; Love *et al.*, 2000a; Morgan & Brightman, 2000). Morgan & Brightman (2000), however, have made the following observations about change in the context of organizational learning:

- *Change is non-linear and is often no clearly defined from beginning to end* – Learning organizations might be viewed as organic in the sense that their learning is a continuous process;
- *Effective change interweaves multiple improvement efforts* – Organizational learning needs to be motivated not only by improved financial performance but also by increasing the focus on the customer, improving and managing work processes and strengthening employee involvement;
- *Driving change through both end of the continuum* – The need to develop into a learning organization needs to be motivated through change that is driven from the top down to create vision and structure. However, there also needs to be a bottom up drive, which encourages participation and involvement. Fundamentally, the creation of a learning organization needs to be the shared responsibility of everyone in an organization;
- *Human side of learning and change* – The development of a learning culture might impact an organization in such a way that it requires employees to re-examine their own values and beliefs. Clearly, unless employees are able to articulate change from a personal dimension, then it is questionable whether they will be able to do so from an organizational perspective; and
- *Benchmarking performance* – Measurable performance indicators need to be in place, which in turn should be able to support the business in pursuit of its goals.

This paper discusses the implications of forming different types of strategic alliances/partnering in construction. A learning model, based on Senge's (1992) five learning dimensions, the work of Morrison & Mezentseff (1997) and the principles of total quality management (TQM), for forming of cooperative alliances between parties in the construction supply chain is then presented and discussed. A case study is used to demonstrate that cooperative relationships can be used to cultivate a climate for reflective learning and mutual trust, beyond merely project-specific performance improvements.

STRATEGIC ALLIANCES VERSUS PARTNERING

Numerous definitions of strategic alliances have been proposed (Bronder & Pritzl, 1992; Takac & Singh, 1992; Mason, 1993; Dowling *et al.*, 1994). For example, Lamming *et al.* (2000) and Walters & Lancaster (2000) have suggested that a strategic alliance exists when the value chain between at least two organizations with compatible goal structures are combined for the purpose of sustaining and achieving significant competitive advantages. The *leitmotif* however, with all definitions is that an inter-organizational relationship is established for a specific purpose where all involved parties are engaged in collaborative behaviour.

The term collaboration has become very fashionable in the social science and management literature (Kanter, 1994; Mintzberg *et al.*, 1996). Yet, according to several prominent authors such as Hamel (1989), Bronder & Pritzl (1992) and Morrison & Mezentseff (1997) alliances can be either collaborative or cooperative in nature. In other words, collaborative strategic alliances refer to parties working together for the short-term and cooperative strategic alliances for the long-term.

In the construction literature, two types of partnering tend to predominate, *strategic* and *project* (Cheng *et al.*, 2000; Li *et al.*, 2000). Project partnering (a relationship established for a single construction project) focuses on short-term benefits, while strategic partnering (a long-term relationship beyond a discrete project) seeks gains for the long-term. Cowan (1991) defined project partnering as a method of transforming contractual relationships into a cohesive project team that comply with a common set of goals and rely on clear procedures for resolving disputes in a timely and effective manner. The CII (1991) defined strategic partnering as a long-term cooperation between two or more organizations committed to achieve specific business objectives by maximizing the effectiveness of each participant's resources.

Fig. 1 presents the relationships that exist between the two different types of strategic alliance and construction partnering. Long-term alliances refer to a

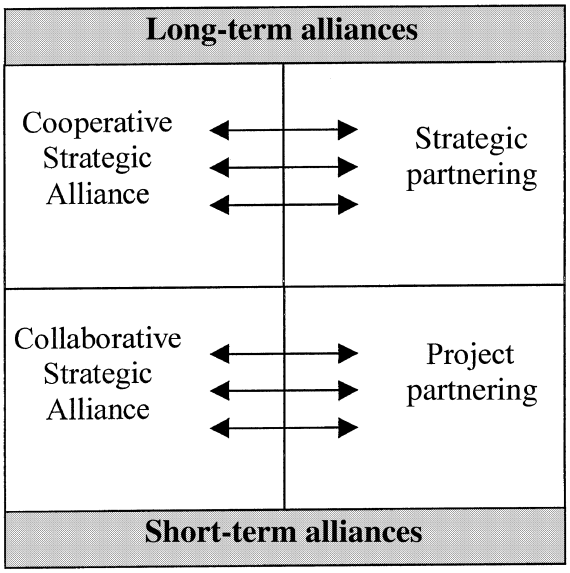

Figure 1 Long-term and short-term alliances.

cooperative relationship between at least two organizations, which is established for achieving long-term goals and objectives, for the purpose of achieving a competitive advantage. More specifically, long-term alliances are a manifestation of inter-organizational cooperative strategies, and entail the pooling of skills and resources through the cooperation of organizations aiming to achieve common goals, as well as goals specific for individual partners. In such instances, intellectual capital and organizational intelligence might be seen as suitable motivations for developing long-term partnerships (Morrison & Mezentseff, 1997; Joia, 2000). Short-term alliances, on the other hand, are collaborative and established between two or more parties who strive for short-term project-related benefits. Usually, parties in short-term alliances have clear alliance objectives – these being project or business-specific. However, as these objectives may not be compatible (perhaps even conflicting) with each individual parties, internal organizational objectives, mutual trust and commitment cannot be easily developed.

Collaborative strategic alliances and project partnering can provide opportunities for parties to work together and create value rather than a basic commercial transaction (Williamson, 1991; Bronder & Pritzl, 1992; Voordijk *et al.*, 2000). It is proffered, however, that organizations that look for short-term benefits may inhibit learning and the ability to critically analyse and improve themselves. Therefore, the type of relationship formed between construction organizations may influence the structure, objectives and learning capabilities of the parties involved in the supply chain partnerships (Voordijk, 1999; Voordijk, 2000). In other words, cooperative strategic alliance or strategic partnering should be the means for establishing a learning alliance in a supply chain.

Short-term alliances

As the construction industry is dominated by one-off projects, it appears that short-term alliances will likely take the leading role in promoting a closer relationship in construction projects (Matthews *et al.*, 1996; Cheng *et al.*, 2000; Li *et al.*, 2001). Hamel (1989) suggests that organizations that enter into short-term alliances are aware that their partners are capable of 'disarming' them by acquiring knowledge about work practices. Furthermore, Hamel (1989) states that acquiring skills and knowledge from their partners is not a devious act, rather it can enable organizations to examine what their competitors are doing best and therefore benefit from the knowledge acquired. Short-term alliances not only provide an opportunity to internalize a partner's skills but can be used as a mechanism to de-stabilize a partner who does not understand the risks inherent in such arrangements (Bronder & Pritzl, 1992; Morrison & Mezentseff, 1997). In addition, short-term alliances can encourage competition between organizations. For example, an alliance between a contractor and subcontractors may lead to competition in both learning of new skills and refining of organizational capabilities in their products and processes.

Organizations entering into collaborative relations initially looking for reduced complexity of their environment and more control over environmental factors may suffer from increased environmental complexity and turbulence because of the creation of new dependencies (Wood & Gray, 1991). In addition, Wood & Gray (1991) and Love *et al.* (2001) argue that increases in complexity may increase transaction costs, the need to manage bilateral and multilateral relations, and the need to develop new skills. Mintzberg *et al.* (1996) argue that joint learning may occur through interaction without partners conceptualizing it as such, and without a collaborative agreement in place. Thus, the best collaboration may in fact be the one least recognized. It is noteworthy that alliances formed for discrete construction projects may not be useful because of the lack of joint learning, which is established by the short-term work environment.

Long-term alliances

As stated previously, long-term alliances encourage partners to commit their resources to the development

of a relationship based on mutual learning (Bronder & Pritzl, 1992; Morrison & Mezentseff, 1997). With a sense of less competition, partners may feel more committed to work together and exchange their knowledge and resources. In the area of construction, Ellison & Miller (1995) used the term synergy to explain such a long-term intimate relationship. A synergistic relationship is used to develop core competencies and pursue corporate and business strategies.

Organizations that rely on cooperation have been found to obtain lower costs for as long as they maintain trust – internally among employees, and externally among members of their network (Ketelholm, 1993; MacBeth & Ferguson, 1994; Black *et al.*, 2000; Holt *et al.*, 2000). Cooperation generates a reflective and mutual learning environment, encouraging the effective transfer of knowledge. In addition, it acts as a mechanism for stimulating mutual satisfaction as well as improving the competitive advantage of partners (Hamel, 1989). However, the success of the strategy is dependent on an organization's ability to evolve and learn. A learning alliance is crucial to a cooperative environment where learning is encouraged and reflective in nature and through which participating parties will strive together to meet the objectives of the relationships (Morrison & Mezentseff, 1997). Mintzberg *et al.* (1996) suggests that within some cooperative arrangements, partners may begin to lose their competitiveness and vision once they become dependent on the capabilities of other parties. If this occurs in the relationship, the less reliant and well sufficient partner may cause a threat to their alliance partner(s) by becoming a direct and powerful competitor. To avoid this derived barrier of cooperative alliances, its structure should include a learning framework that enables alliance partners to openly reflect their knowledge and information whilst retaining the visions for the alliance as well as their individual organization. According to Morrison & Mezentseff (1997) this mechanism should be integrated into the relationship to allow all parties to benefit from the shared knowledge. The sharing of knowledge may stimulate learning, which is considered to be the fundamental ingredient for continuous improvement within strategic alliances (Bronder & Pritzl, 1992).

LEARNING AND UNLEARNING IN CONSTRUCTION

Long-term alliances are constructed in order to transfer knowledge, skills and resources to involved partners. This entire process relies on a learning mechanism to complete this cycle. Without a learning environment to encourage the effective and accurate transfer of information, the benefits to the formed alliance are minimal. Cooperative learning is more intense and evacuative in comparison with those that are collaborative in nature. Senge's (1992) definition of a learning organization addresses the issue of cooperative learning. Similarly, Crossan & Inkpen (1995) emphasize that the ability of alliances to extract knowledge and skills from each other is important for survival. Crossan & Inkpen (1995) have noted from their research that the process of learning is based on single loop learning as illustrated in Fig. 2. They found that learning opportunities are not typically exploited in a form consistent with their initial learning objectives. Consequently, the primary barrier to learning is considered to occur at an individual level where learning opportunities are not exploited because the alliance experience conflicted with the existing set of managerial beliefs.

Double loop learning, as illustrated in Fig. 3, can help overcome such problems stated by Crossan & Inkpen (1995). Double loop learning incorporates a high level of evaluation and analysis of information into knowledge that enables changes to be made accordingly. It also leads to the development of creativity in the problem solving process, which Argyris & Schön (1978) refer to as *deutro-learning*, that is, learning about learning. Essentially, deutro-learning occurs when organizations learn how to carry out single-loop and double-loop learning simultaneously.

Long-term alliances aim to incorporate a learning environment that encourages mutual understanding and benefits from the relationships. With this in mind, such alliances should essentially be viewed as learning alliances as the relationship appears consistent with those of a learning organization (Morrison & Mezentseff, 1997).

As well as learning, Nyström & Starbuck (1984) suggest that organizations must also unlearn to survive. Noteworthy, however, unlearning is not the opposite of learning. Unlearning involves breaking with current behaviours/and or mental modes, while learning can either lead to a whole new way of understanding and acting, or build on those that exist. Hedberg (1981)

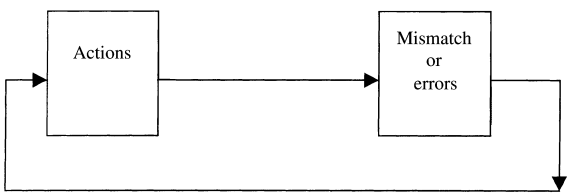

Figure 2 Single-loop learning (Argyris, 1990).

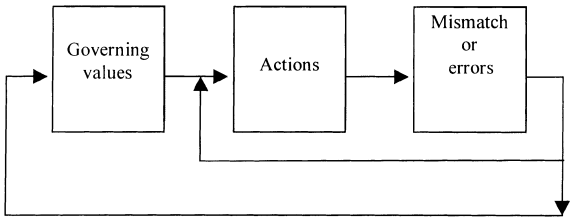

Figure 3 Double-loop learning (Argyris, 1990).

defines unlearning 'as the process through which learners discard (previous) knowledge (that is outdated)'. Hamel & Prahalad (1994) note that unlearning must take place before learning can begin. McGill *et al.* (1992) further stated that much of the basis for productive learning resides in unlearning. Whether we can actually ever erase outdated knowledge as if we were deleting files from a computer hard drive is a contentious issue and its discussion is outside the scope of this paper.

In practice, unlearning is an important element of strategic renewal and organizational transformation (Talwar, 1994; Love *et al.*, 2000a). For construction organizations to adopt and learn new approaches to work and management, they must first begin to unlearn (Love *et al.*, 2000a). For example, implementing inter-organizational or cross-functional teams may well mean that the traditional definitions of boundaries, roles, responsibilities and authority have to be abandoned. Fundamentally, it is suggested that before construction organizations consider forming a strategic alliance, a degree of unlearning must take place. That is, current modes of operation should be disregarded so that a different behaviour can be encouraged and induced, which can subsequently lead to the formation of an effective learning alliance.

THE LEARNING ORGANIZATION

The notion of organizational learning is not entirely new but we can usefully differentiate between a long time interest in learning as a concept in organization theory, and the more recent focus on the idea of the learning organization. The former is concerned with enhancing the processes of learning in order to improve individual and collective organizational actions via improved knowledge and understanding. The latter focuses on the design of organizations to deliberately facilitate the learning of members and therefore improve collective adaptation (Coopy, 1995). The authors suggest that the debate concerning the anthropomorphism of claiming that organizations have memories can be set aside (Holt *et al.*, 2000). Indeed, memory initially resides in individuals but can also occur in systems, structures and many dimensions of organizational culture (Walsh & Ungson, 1991). Love *et al.* (2000a) suggests that at present, there is wide debate in the area, and while consensus seems far off, there is some overall agreement in that:

- organizational learning is more than the sum of members' learning;
- environmental alignment is vital; and
- the probability of learning is affected by the degree of environmental turbulence, the rigidity of organizational structure, the adequacy of the organization's strategy and the strength of its culture.

Many organizational theorists place emphasis on the systems-structural approach focusing on information systems, while others prefer the interpretative path and much less tangible dimensions of the phenomenon centred on meaning. Far less frequently are the two brought together to enhance understanding, analysis and a richer picture of this complex concern. The complexity of organization learning grows when one considers the different types of learning that exist, ranging from adaptive to institutional experience embedded in accumulated organization efficiencies in terms of experience and tradition. Others suggest single loop or adaptive learning; double loop or generative learning; and triple-loop learning as dialogue (Argyris, 1993; Isaacs, 1993).

The aforementioned learning types involve incremental and adaptive learning focused on changing routines and learning about learning through revealing and altering the tacit infrastructure of thought. When the different levels of learning are aggregated – individual, group and organization-wide and the problem of knowledge types – explicit and tacit – as expounded by Nonaka (1991), the problem grows. Considering the above, the authors suggest that for construction alliances to improve customer satisfaction, the involved parties must be able to learn collectively. Essentially, the concept of the learning organization provides a paradigm for collective learning. Traditional notions of the organization see it as a place where learning takes place automatically and where individuals acquire new knowledge and/or experience. This concept, however, suggests that in a successful organization, it is the organization that learns. If an individual leaves the organization, the knowledge acquired remains in it. In a learning organization, teams develop knowledge by working as a unit.

At both strategic and operational levels, cooperative alliances can be used to establish long-term relationships, which over time will enhance their capacity to

provide value to customers and suppliers throughout their supply chains. As members of the alliance develop new skills and capabilities, they alter what they can do and understand in the supply chain environment. Consequently, the individuals that make up the alliance learn to learn together (e.g. inter-organizational teams). Mechanisms, such as those ingrained within the alliance (e.g. customer–supplier focus and benchmarking, which are components of TQM) can allow effective learning to take place (Hill, 1996; Nesan & Holt, 1999; Mandal *et al.*, 2000). Essentially, the organization, besides being a place where kinds of activities and operations are performed, becomes a 'giant laboratory' where people at all levels are constantly experimenting with and testing new practices and techniques.

Sometimes, construction organizations can rely on other management tools to develop the *learning disciplines*, which are identified by Senge (1992) – including personal mastery, mental models, shared vision, team learning, and systems thinking, that can institutionalize the learning habit (Love *et al.*, 2000a). For example, organizations that readily adopt and are committed to TQM will be uniquely prepared for the learning disciplines (Garvin, 1993). Yet, none of the above can be effectively applied without the constant cooperation of all persons in the involved organizations. That is why successful organizations put a special emphasis on practices such as empowerment, mobilization and motivation, making sure that they penetrate the entire workforce, from the top management down the hierarchy of authority (Nesan & Holt, 1999).

A MODEL FOR CONSTRUCTION ALLIANCES

The model for construction alliance founded on TQM and an integrated supply chain is illustrated in Fig. 4. A detailed review of the relationship of TQM and learning can be found in Love *et al.* (2000a). In this section, the main focus is on the systems thinking submodel. As can be seen in Fig. 4, the essential components of it include: learning culture; knowledge and communication; changing mental modes; joint learning structure/processes; and development of learning relationships. This submodel is adapted from the learning framework proposed by Morrison & Mezentseff (1997), but the former is institutionalized for the strategic construction

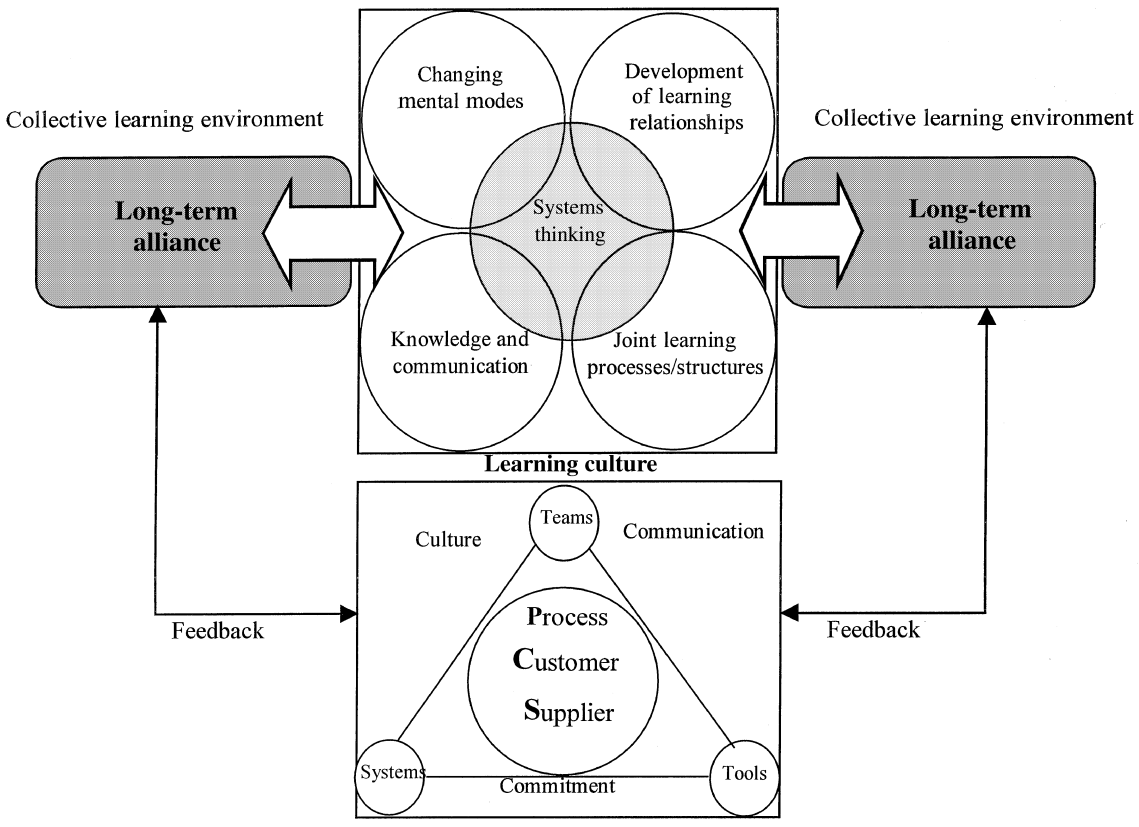

Figure 4 A model for construction alliances.

alliance. The aforementioned components are described herein after.

Systems thinking

According to Jackson & Keys (1991), most models of learning organizations are little more than descriptions of effective organizations and do not offer many solutions for solving complex problems. The underlying theme of the learning organization models, that are genuinely different from the traditional approaches, is systems thinking (Senge, 1992, 1994; Morrison & Mezentseff, 1997; Senge *et al.*, 1999). This form of thinking has a systemic and holistic focus, and can facilitate organizational learning within alliances. This framework places emphasis on the philosophy of TQM to establish the alliance environment whereby partners attempt to become process-focused. Thus, this can enable benchmarking to be used as a feedback mechanism, with respect to alliance performance (Li *et al.*, 2001). In other words, feedback processes need to be in place to provide information about what has to be learned as well as what has been undertaken (Fig. 3). Benchmarking can also be used as a mechanism for providing financial (business performance), technical (productivity measurement) and efficiency (human contribution measurement) indicators for comparing the performance of alliances over a period of time (Love *et al.*, 1999). In essence, benchmarking should be viewed as an operational process of continuous learning and adaptation that results in the development of an effective alliance (Love *et al.*, 1998; Li *et al.*, 2001).

Project managers and the like within the alliance need to have an understanding of how its subsystems are interconnected, and how they can individually influence the quality of the final product or service. This involves the ability to see relationships between issues, events and information as a whole or as patterns, rather than as a series of unconnected parts. Systemic thinking involves adopting a holistic rather than fragmental approach to problem solving. A system perspective concentrates on understanding how relevant factors collectively interact to give rise to the problem. Within a TQM environment, systemic thinking can be used by organizations to develop strategies for relationship building, as a primary principle of TQM is effective customer-supplier relations (Oakland & Sohal, 1996). Subsequently, this strategy becomes the focus of the relationship, particularly if the alliance is formed throughout the supply chain. With effective leadership provided by management throughout all levels of the organizations involved in the alliance, behaviour can be guided by jointly agreeing on the goals of the relationship.

Learning culture

It is suggested that if an alliance is to enhance its potential for learning, there is a need for TQM to be ingrained within the culture of the organizations involved in the alliance. To foster organizational learning, it is necessary to concentrate on both individual and group skills, design of support structures and the creation of an overall organizational attitude that encourages learning. As mentioned above, managers at various levels within the alliance organizations need to create and stimulate an appropriate organizational environment for learning. Mistakes and problems must be seen as opportunities to learn and there need to be honesty and trust within the alliance for learning to take place (Crossan & Inkpen, 1995). Essentially, the alliance must recognize that learning requires openness to new ideas. There must be a firm commitment from senior management to free up employees so they can have some time to reflect and review their actions. This approach is embedded in the process of double-loop learning. By encouraging the use of this process of learning, alliance members are required to act as change participants and advance with a dynamic relationship where the transfer of knowledge and information is intense and valuable. Such an innovative thought process may encourage successful outcomes to problems experienced by the alliance partners.

Research undertaken by Osland & Yaprak (1995) indicates that organizations that effectively cooperate with one another are better able to adapt to dynamic environmental changes and satisfy their customers. An important factor of learning is the encouragement of dialogue among alliance members. All partners of the alliance must be able to receive and disseminate information across the boundaries of the construction supply chain and external environment. For example, advance information and communication technologies for electronic and Internet commerce can be used to improve communication, and the time to market products and services to customers (Cheng *et al.*, 2001). Yet, the effectiveness of the alliance will be dependent on frequent day-to-day correspondence between all members of the alliance in a supply chain environment. Again, information and communication technologies have a significant role to play in improving inter-organizational relations, as distributed information management systems can be used for constant communication between alliance

partners, which can facilitate learning (Deng *et al.*, 2001).

Knowledge and communication

Critical to organizational learning is how knowledge is communicated. In addition to the ability of organizations to generate new knowledge continuously, Nonaka (1991) suggests that sustaining long-term success relies much on the possibility to initiate technological innovations that help transmit the knowledge as wide as possible. Moreover, alliance partners should be aware of the ease of access to various forms of knowledge, which include information about people, facilities, management systems and practices, and knowledge about differences in values and beliefs (Morrison & Mezentseff, 1997). Levinson & Asahi (1995) suggest that alliances can sustain joint learning structures if the following steps are integrated into the relationships:

- keep track of new knowledge;
- interpreting and transferring new knowledge;
- applying knowledge by regulating behaviour to attain intended outcomes; and
- institutionalizing knowledge by reflecting on the real context and adjusting learning behaviour.

Knowledge and communication are valuable components of the framework and need to be constantly monitored and extended by senior management.

Changing mental modes

The most significant learning that can take place in organizations involves changing mental modes (Senge, 1992; Crainer, 1998). Mental modes are concerned with the deeply held assumptions, images and generalizations that influence how people understand the world and the actions they take (Morrison & Mezentseff, 1997). Essentially, people have to learn how to manage (i.e. to surface, examine and adjust) their mental modes to cope with change. In order to move toward a learning alliance, people with strategic relationships need to share their mental modes accordingly. This process involves incremental changes in mental modes, which accumulate over a period of time, resulting in the establishment of long-term embedded beliefs. In fact, changing mental modes may help people improve their decision-making, particularly with regards to identifying what action to take, what choice to make, and what knowledge to learn.

People within the alliance should try to develop two distinct skills in order to maximize the process of surfacing, testing and sharing mental modes (Morrison & Mezentseff, 1997). First, reflection, the slowing down of thinking processes, to the extent where people can become aware of how mental models are formed. Secondly, inquiry, being able to hold conversations where they can share their views and develop an understanding about people's assumptions and beliefs about the alliance.

Joint learning structure/process

To support a learning climate within an alliance, joint learning structures, strategies and processes need to be developed (Morrison & Mezentseff, 1997). This involves designing appropriate and attractive reward and incentive systems that can motivate individual learning, which in turn facilitates organizational learning. Other supportive strategies include establishing mechanisms for collecting and transmitting information from within and outside the alliance. Shared learning within the alliance may enable participants to develop shared visions that project to future technological advancements, management innovations and new products and services. In essence, an alliance that incorporates shared learning encourages a strong foundation for a relationship built on a set of influential factors including mutual trust, long-term commitment, continuous improvement, common goals, etc. (e.g. Cheng *et al.*, 2000).

Development of learning relationships

To improve the effectiveness of a supply chain, long-term alliances are needed to stimulate learning. However, the building of learning relationships can be an arduous process. Individuals involved in the process may have a firm commitment to their own organization, their own personal agenda and unique mental model of the situation (Morrison & Mezentseff, 1997). This may create complex responses to different changes. Thus, there is a need for senior management to encourage and assist with the development of the relationship. For the alliance to learn, the role of managers may need to change; that is, to become designers, teachers and stewards (Senge, 1992). It is important for managers to recognize that their main role in establishing learning relationships is that of coordinator and as a result this will require an effective management style that is able to extend across the relationship. It is envisaged that a consistent management style across the alliance will enable participants of the relationship to be focused and to provide a shared vision (Morrison & Mezentseff, 1997). The level of and the processor of the power

within the alliance will, however, affect its vision and as such parties must agree on the facilitator for the alliance.

CASE STUDY

A case study can be simply defined as 'methodology based on interviews, which are used to investigate technical aspects of a contemporary phenomenon with its real life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used' (Yin, 1989, p. 3). In this paper, findings from a single case are used to demonstrate that the proposed model for supporting inter-organizational relations is applicable to practice. This single case provides valid findings from which other organizations can learn.

Data collection

The data collection procedure followed the major prescriptions by most textbooks in doing fieldwork research (e.g. Fiedler, 1978; Yin, 1989; Dane, 1990). A variety of data have been used to derive the findings presented in this paper, which included interviews, direct observations, and documentation provided by the. Bearing in mind the array of evidence that was accumulated, great care was taken to ensure that the data collected converged on similar facts (Jick, 1979).

Interviews were conducted with three senior executives to elicit their opinions about their alliance and about learning practices employed. The duration of each interview was approximately 45 min. Every interview was conducted on a one-to-one basis so as to stimulate conversation and breakdown any barriers that may have existed between the interviewer and interviewee. The interviewee was allowed to talk freely without interruption or intervention. In this way the interviewer acquired a clearer picture of their perspective. Interviews were used to gain (Easterby-Smith *et al.*, 1991):

- an understanding of the constructs that the interviewee used as a basis for forming opinions and beliefs about the performance of the organizations quality system;
- an understanding of the step-by-step logic of why and how an event occurred; and
- the confidence of the interviewee, to overcome the reluctance to be truthful about an issue other than through a confidential one-to-one situation.

The authors acted as a neutral medium through which questions and answers were transmitted and therefore endeavoured to eliminate bias. Essentially, bias in interviews occurs when the interviewer tries to adjust the wording of the question to fit the respondent or records only selected portions of the respondent's answers. Most often, however, interviewer bias results from the use of probes. These are follow-up questions and are typically used by interviewers to get respondents to elaborate on ambiguous or incomplete answers. Thus in trying to clarify the respondent's answers the interviewer were careful not to introduce any ideas that may form part of the respondent's subsequent answer. Furthermore, the interviewers were also mindful of the feedback respondents gained from their verbal and non-verbal responses. Thus, the interviewer avoided giving overt signals such as smiling and nodding approvingly when a respondent failed to answer a question. It was decided that such actions could lead to respondents withholding responses to later questions. The interviewees reviewed the reports from the interviews and their views were invited to ensure their accuracy. In order to secure the confidentiality the involved parties' involved, fictitious names have been used and the narratives modified. The essence of the case was however, preserved to ensure the provision of real information for analysis.

Case study background

An exploratory analytical strategy is used to demonstrate how a consultant organization formed a long-term cooperative alliance with parties in a project who joined to form a learning alliance. The strategy was based on the six major aspects of the learning (i.e. system thinking, learning culture, knowledge and communication, changing mental modes, joint learning structure/process, and development of learning relations) identified in the alliance model presented in Fig. 1. The related key characteristics of these six aspects are shown in Table 1. In practice, these characteristics were expected to form the rules that could be used to establish the major components for a learning alliance. Therefore, model not only is appropriate for research analysis but also provides a snapshot overview of the key principles for those who want to build such a learning culture.

Excel consultant provides structural and architectural design consultancy in the areas of building design and civil engineering. This firm attempted to establish an informal but highly communicative relationship with parties of a large project that was successfully secured. As the project would last for a period of 8 years, an alliance that would encourage teamwork was sought. Although the project has only been running for 2 years,

Table 1 Major aspects and key characteristics of a learning alliance and the analysis results.

Major aspect	Associated key characteristics	Analysis results
Systems thinking	Rule 1. The learning alliance adopts a holistic rather than fragmental approach to problem solving	++
	Rule 2. Benchmarking is used as a feedback mechanism with respect to the performance of the alliance. Feedback processes need to be in place to provide information about what has to be learned as well as what has been undertaken	++
	Rule 3. Collective establishment of common goals with financial (business performance), technical (productivity measurement) and efficiency (human contribution measurement) indicators for comparing the performance of alliances to achieve the goals over a period of time	++
	Rule 4. Emphasis on customer–supplier relationship to develop a strategy for relationship building for alliance parties. This involves the establishment of an inter-organizational team that consists of members along the supply chain	++
	Rule 5. Using jointly agreed goals to guide behaviour	+
Learning culture	Rule 1. Selecting the right people into the inter-organizational team who have the ability and the necessary skills to develop a learning culture within the team and an appropriate organizational climate for learning	++
	Rule 2. Design of support structures and the creation of an overall organizational attitude that encourages learning. Mistakes must be seen as opportunities to learn	+
	Rule 3. Some factors are critical to such a learning culture. For example, honesty, trust, openness to new ideas, commitment from senior management, are all critical factors to free up employees to learn	+
	Rule 4. Dialogue with alliance members is encouraged. Workshops or meetings are the place for experiencing the learning culture. Information technology such as Internet helps to receive and transmit information in a virtual environment	++
Knowledge and communication	Rule 1. The learning alliance becomes aware of and identifies new knowledge	++
	Rule 2. The learning alliance is able to transfer and interpret new knowledge	+
	Rule 3. The learning alliance can use the new knowledge by adjusting behaviour to achieve anticipated outcomes	++
	Rule 4. The learning alliance can institutionalize the new knowledge by reflecting on what is happening and adjusting earning behaviour	+
Changing mental modes	Rule 1. The alliance team always challenges the existing practices when performance is not favourable	++
	Rule 2. A problem that cannot be solved in one joint meeting will be put forward to the next meeting and so on until the problem can be solved	++
	Rule 3. Measures are used to evaluate the performance and agenda is used to raise the issues for discussion so those team members can study the issues independently or collectively through other possible means such as email before attending the meeting	++
Joint learning structure/ process	Rule 1. Setting reward and incentive systems that encourage both individual and organizational learning	+
	Rule 2. Establishing mechanisms for collecting and transferring information from inside and outside the alliance	++
	Rule 3. Shared learning is encouraged within the alliance team	++
Development of learning relations	Rule 1. There is a need for senior management to encourage and assist with the development of the inter-organizational team	++
	Rule 2. Representatives in the team are the change agents and should be empowered	++
	Rule 3. An independent facilitator is hired for developing shared vision and goals	++

+, Partly achieved; ++, well achieved.

the alliance team has suggested that it is performing extremely well. It has also been treated as a benchmark in the Hong Kong construction industry. It was considered that such an alliance would naturally improve project time and cost performance as well as quality.

Prior to the formation of the alliance, an external facilitator was hired to organize the formation of the alliance meetings so as to promote trust and commitment as well as to focus each party on the goals and objectives of the project. An inter-organizational team was formed and members met each other during scheduled meetings to appraise alliance performance, to set progress goals, and to solve problems that arose. There were several major establishments by the facilitator that were particularly useful for initiating a learning alliance, which included:

- *Envisaging the acquisition of knowledge* – The facilitator encouraged the participating companies to

learn from each other and to be aware of their competitors. Benchmarking was a word that was commonly used during meetings.

- *Encouraging open lines of communication* – Communication was treated as an important function that helped to link the parties together. He stressed that every kind of possible communication channels should be developed. New information and knowledge must be circulated within the alliance network as fast as possible. This forms a supportive structure for a learning culture.
- *Highlighting the importance of stabilising alliance goals and objectives* – Goals and objectives specific to the alliance were created. As the relationship was extended beyond the formal contract between the parties, project objectives could not reflect the real performance they wanted. To create new goals and objectives is a crucial component to induce learning that aims at higher levels of performance. Fig. 5 is the charter established by the parties who signed and agreed to commit. The charter consisted of 10 goals to achieve.
- *Emphasizing joint problem resolution* – Solving problems together is an effective means for developing learning alliance. During the problem solving process, parties joined together to understand the problem, to raise discussions, to express own opinions and ideas, to learn from each other, to find out the solution collectively, and finally to experience a collective learning process.
- *Promoting the cooperative effort to trace performance* – Tracing the performance that was to achieve the alliance goals and objectives gave a clear picture of what to improve, resulting in knowing what to learn to improve. They held meetings discussing the performance charts as well as the areas to improve.

Propagation of learning alliance rules

To determine whether the cooperative alliance was able to represent a learning alliance, the rules (i.e. associated key characteristics) of the six major aspects of learning alliances were tested (Fig. 1). Ordinal measures (i.e. not achieved, partly achieved and well achieved) of the rules were sufficient to test the items established for the case study. Table 1 indicates that most of the rules were well achieved, showing that the tested alliance has developed a learning climate, similar to that of a learning alliance identified above. Findings from the case study indicate that a long-term relationship can be used to cultivate a climate for mutual learning, and enhance the development of trust, commitment and communication.

The Charter

1. To meet or even shorten the project completion dates.
2. To accomplish the financial budgets of all parties.
3. To construct a quality product which satisfies the client's requirements.
4. To recognize the expectations of other parties in a co-operative work environment.
5. To achieve the best safety standard according to local legal practice.
6. To recognize the importance of problem resolution for minimizing disputes and conflicts as early as possible, leading to no litigation.
7. To establish and sustain open communications.
8. To attain a successful project that can enhance the reputations of all parties.
9. To take ethical consideration of the social and environmental responsibility.
10. To recognize and manage inherent project risks.

Figure 5 Charter for a strategic alliance.

Whilst remaining focused on the project objectives, such as reduced costs and improved quality, such a cooperative relationship will create a strategic and sustainable competitive advantage in today's competitive environment. It is suggested that construction organizations forming long-term alliances that incorporate the essential elements of the proposed learning model can gain an advantage over their competitors through the implementation of a customer–supplier focus and strategic relationships. The learning alliance has enabled the joined parties to be more reliable and durable, and highly competitive and responsive. It is noteworthy that the case also reveals the benefits provided by the long-term alliance, which include improved:

- *Problem solving process* – Previously, they solved problems individually. Presently, they solve them together so that they could think out more available solutions faster than before;
- *Project performance* – Project performance in terms of quality, time, schedule and cost have been achieved. Other performances having been stated in the charter including safety and social responsibility have also been achieved – not to mention that other associated project issues such as rework, waste, claims, etc., were reduced when compared with other project alliance members had been involved in;
- *Knowledge and competence of workforce* – A learning alliance not only acquires updated knowledge but also improves ability of their staff. Such a workforce is considered to be more productive and less likely to make mistakes;
- *Inter-organizational relationships* – Parties are able to communicate in an open manner, which also improves coordination. While parties are mutually dependent in dealing with project matters, they are independent in running their own organizations. Thus, they are able to learn externally as well as internally; and
- *Stakeholder satisfaction* – The parties revealed that they had satisfied their stakeholders, which included clients, design consultants, contractors, suppliers and end-users. In addition, continuous improvement was fostered (improved productivity and profits) within the alliance, which has resulted in a strategic competitive advantage (when bidding for new projects), as those organizations involved in the alliance have been invited to procure additional projects.

The alliance has been in place for 2 years and positive outcomes have enabled the alliance team with a good foundation to improve their learning capabilities over the next 6 years project. The cooperative alliance is setting standards within the Hong Kong construction industry for its ability to foster working together in a harmonious and diligent manner.

CONCLUSION

This paper has demonstrated that cooperative learning alliances can create a shared vision of mutual learning. Such learning can enhance a construction organization's capacity to learn as well as improve the effectiveness of their business operations, which can result in internal and external customer satisfaction. The authors suggest that construction organizations looking for long-term alliances that incorporate the essential elements of the proposed inter-organizational learning model (founded on TQM) can gain a competitive advantage over their competitors through the implementation of a customer–supplier focus and strategic relationships. Apart from the theories presented this paper, The case presented revealed the relationship between a cooperative long-term alliance and the learning alliance. As this is a single case study, the results can not be generalized, however, researchers are encouraged to test these alliance rules that have been propagated. In general, the results indicate that cooperative relationships can be used to cultivate a climate for mutual learning, and trust whilst remaining focused on the alliance objectives. It may not only reduce costs, but can also ensure a strategic and sustainable competitive advantage in today's environment.

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