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Partnering research in construction

HENG LI*, EDDIE W. L. CHENG* & PETER E. D. LOVE†

**Department of Building and Real Estate, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong;*
†School of Architecture and Building, Deakin University, Geelong, Victoria 3217, Australia

Abstract Since the emergence of partnering in the construction industry in the late 1980s, it has received a great deal of attention from practitioners and researchers. The published research that is presented in the major journals typically advocates guidelines and models for implementing partnering. To date, however, no paper has attempted to summarize and present a critique of the existing partnering literature. This paper, therefore, reviews the partnering literature that has been published in four high quality rating journals, these being *Construction Management and Economics, ASCE Journal of Construction Engineering and Management, Engineering, Construction and Architectural Management* and *ASCE Journal of Management in Engineering*. It is concluded that there were four major themes of empirical studies, which were research on project partnering, examining a dual relationship, international partnering and a special application of partnering. Moreover, nonempirical studies were classified as the types of partnering, partnering models, partnering processes and partnering structure. The review provided in this paper 'polishes the signposts' and offers new directions for partnering research and its application in construction. Future studies are recommended to emphasize on the identification of performance measures and critical success factors, development and test of partnering models and processes, and the formation and selection of partnering strategy.

Keywords alliance, construction, integration, partnering, partnership, project management

INTRODUCTION

Since the emergence of partnering in the construction industry in the late 1980s, it has become a primary management strategy for improving organizational relations and project performance. Research into construction partnering research has become ubiquitous. Consequently, many research and practice papers have been published in the mainstream construction journals. The idea of partnering is relatively new to the construction industry when compared to other industries such as manufacturing. Partnering has yet to mature in construction, which is evident in the diversified nature and scope of studies that have been undertaken to date. Despite the copious number of articles on partnering that have been published, a comprehensive review and critique of the research on partnering has not appeared.

The existing partnering literature offers various degrees of value to the construction parties to facilitate the partnering practices. Rather than argue for a particular viewpoint, the authors believe that it would be more beneficial to investigate systematically what we do know about partnering and how we can proceed to learn more. Rather than continue to refer to and quote what is widely recognized in the literature or develop new prescriptions for implementing partnering, the authors specify the type of investigations needed to generate the knowledge base for improving our understanding of partnering issues. Therefore, the authors do not attempt to create any theoretical framework that would justify the needs for partnering, but intend to provide a summary and a systematic critique of previously published partnering research and to provide suggestions for future research and applications for practice.

The paper is divided into three main parts. Firstly, the general background of partnering, including its definition and benefits, is presented. Secondly, a critical review of partnering research published during the last decade, which also compares and contrasts various viewpoints, is undertaken. And thirdly, future research directions and practical applications are proposed.

PARTNERING DEFINITIONS

Because partnering in construction is yet to mature, a myriad of definitions exist. According to Crowley & Karim (1995), partnering can be defined in one of the following three major ways:

1. The anticipated outcomes or attributes of partnering, such as compatible goals, mutual trust, long-term commitment, etc.

2. The process that led to the outcomes where partnering is used as a verb to indicate an action, such as committing to common goals, organizing partnering workshops, developing trust, etc.
3. The organizational interface that generates the new organizational structure.

Cowan (1991) defined partnering as a co-operative approach to contract management for the purpose of reducing costs, litigation and stress. Abudayyeh (1994), on the other hand, defined it as a commitment to recognize owner–contractor relationships as integral parts of the daily operations involved in construction. These two definitions are echoed by the National Economic Development Council (NEDC, 1991), which defines partnering as:

> "a contractual arrangement between a client and a chosen contractor which is either open-ended or has a term of a given number of years rather than the duration of a specific project. During the life of the arrangement, the contractor may be responsible for a number of projects, large or small and continuing maintenance work and shutdowns. The arrangement has either formal or informal mechanisms to promote co-operation between the parties" (1991; cf. Matthews *et al.* 1996, p. 119).

The above definitions do not explain how to achieve such a relationship. According to Crowley & Karim (1995), partnering can be conceptually viewed as an organization that is formed by implementing a co-operative strategy that modifies and supplements the traditional boundaries between separate companies in a competitive market. Translating this concept to a working definition of project partnering, which is 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 (Cowan *et al.* 1992).

Beyond a single project, partnering can be formed in strategic terms. The Construction Industry Institute (CII) provides a definition of strategic partnering that brings together the essential components to define such a relationship as well as the arrangement requirements and potential benefits. The CII (1991) defined strategic partnering as:

> "a long-term commitment between two or more organizations for the purpose of achieving specific business objectives by maximizing the effectiveness of each participant's resources. This requires changing traditional relationships to a shared culture without regard to organizational boundaries. The relationship is based upon trust, dedication to common goals, and an understanding of each other's individual expectations and values. Expected benefits include improved efficiency and cost effectiveness, increased opportunity for innovation, and the continuous improvement of quality products and services."

Table 1 Some major project problems

Thompson & Sanders (1998)	Redundant efforts
	Disappointing termination of relationships
	Too much supervisory activities
Crowley & Karim (1995)	Detrimental outcomes, such as litigation, lost time, wasted money and poor morale
Wilson *et al.* (1995)	An inherent lack of communication and cooperation among contractual parties results in cost and schedule overruns, and ultimately litigation

PARTNERING IN CONSTRUCTION

Construction projects rely on the integrated efforts of several hierarchically linked parties (including architects, engineers, surveyors, general contractors, subcontractors, suppliers, etc.) by using their differentiated skills, knowledge and technology. These parties are usually independent organizations with separate sets of objectives and goals, management styles and operating procedures. Due to the fragmented nature of the construction, problems such as communication and co-ordination are encountered frequently, which can affect the performance and productivity of projects. Together with other project problems (see Table 1), construction work is difficult to plan, organize, lead and monitor.

The construction industry in most developed countries has suffered dramatically from two major changes in its business environment. Firstly, there were high inflation rates and oil embargoes in the early 1970s (Cook & Hancher 1990). Secondly, entering into the 1990s, it is facing new prominent changes (Thompson & Sanders 1998). In summary, these changes are:

- increased competition,
- higher standards for competitive success,
- dwindling resources,

Table 2 Possible reasons for and potential benefits gained from forming alliances

Reasons for forming alliances	Access technology
	Share risks
	Secure financing
	Enter new markets
	Serve core customers
	Improve competitive position
Benefits gained from alliances	Enhance competitive position
	Increase market share
	Obtain new work
	Broaden client base
	Increase cultural responsiveness
	Reduce risk
	Increase profits
	Increase labour productivity

Source from Badger & Mulligan (1995).

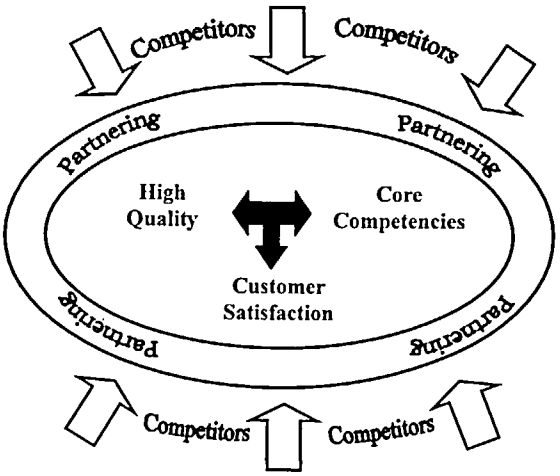

Figure 1 Partnering as a cohesive boundary.

- the existence of a global market/economy,
- enhanced legal concerns,
- accelerated emergence of new technology,
- the need for more flexibility and faster response time,
- regular internal operations assessment, and
- the increased risk in construction contracting.

Such changes have initiated a crisis in construction and as a result, organizations have aggressively searched for better management solutions to improve their performance and sustain a competitive advantage by embracing concepts such as total quality management (TQM), business process re-engineering (BPR) and partnering. While TQM and BPR require substantial investment in terms of time and cost, partnering can provide quick results with minimal start-up costs (Wilson *et al.* 1995). Partnering in construction is expected to be separated from typical partnership, as the former promotes advantages such as risk sharing and joint problem solving (Cowan *et al.* 1992). Other than these advantages to form alliances, according to Badger & Mulligan (1995), there are some other possible reasons and potential benefits for the construction projects, as depicted in Table 2.

The essence of running a construction business in the 1990s is to establish one's own core competencies and provide quality services to customers, leading to customer satisfaction (Ellison & Miller 1995). Looking ahead to the 21st century, organizations should be aware that customer satisfaction might continue to be a major indicator of business success. Thus, the development of a partnering strategy is needed to strengthen an organization's competitive advantage in order to achieve their business targets and prevent the attacks from competitors (see Fig. 1).

METHODOLOGY

This paper chose to review the last 10 years' issues of four major construction management journals—*Construction Management and Economics*, *ASCE Journal of Construction Engineering and Management*, *Engineering, Construction and Architectural Management* and *ASCE Journal of Management in Engineering*. The selection of these journals was based on the study of Chau (1997), who found that these four journals had the highest scores in quality rating. The peer-reviewed articles were retrieved based on the table of contents and the subject index of target journals. Keywords for 'scanning' were partnering, partnership, alliance and integration. These terms were well known of having been used in writing papers on construction partnering. The authors had considered the term 'relationship'. However, there were too many construction information technology papers using this term to specify the relationship between construction parties pertaining to information flow, which were not related strongly to construction partnering. Therefore, this term was omitted. The procedures for retrieving the partnering papers were as follows:

1. The titles of the articles were scanned with the keywords. Altogether, there were 20 articles that contained one of the keywords in their articles' titles, which are either 'genuine' construction partnering papers or closely related papers. It is noted that certain publications, although having been cited, were not written solely in the context of the construction industry (e.g. Brooke & Litwin 1997) or partnering (e.g. Krippaehne *et al.* 1992). Specifically, Brooke & Litwin (1997) identified the critical success factors of project partnering from multidisciplinary project management organizations, while Krippaehne *et al.* (1992) suggested characteristics of project organizations' integration, which are similar to those of construction partnering. These articles, therefore, were reviewed in this paper.
2. Missed articles were then identified from cross referencing of cited studies and other construction management abstract's databases. Less related articles were excluded. For example, some papers just include a small section on partnering, which could not be judged to be a relevant paper (e.g. Bakens 1997). Some other papers focusing specifically on a narrow range of contextual characteristics of partnering, such as information integration (e.g. Ahmad *et al.* 1995), conflict resolution (Fenn *et al.* 1997) or communication problems (e.g. Loosemore 1995), were also excluded as these papers did not clearly mention the presence of partnering. As a result, nine articles were added that had pertinent content with respect to partnering relationships in construction.

The authors admitted that there are other partnering publications having been published in other journals. However, the scope of study (including the selection of the four highest rating journals) was based on a valid research methodology. Instead of including these publications in the review section, some of them were cited in other sections as deemed to be appropriate. Table 3 lists the 29 reviewed articles of the target journals. These articles are expected to be of high quality as they were published in the highest rated journals, while each of them had pertinent content relating to construction partnering.

PARTNERING RESEARCH IN THE PAST

Nature of partnering research

The existing literature being reviewed consists of both empirical and nonempirical studies. The nonempirical studies are mainly the conceptualization and operationalization of different types of partnering and prescriptions of how to initiate and implement a partnering process. Their contributions will be described in detail in the next section under the subheadings of Types of partnering, Partnering models, Partnering processes and Partnering structure. In the following section, we shall mainly deal with the empirical studies that were conducted in the past decade, providing a critique of these studies and suggesting directions for undertaking future research. More emphasis would be placed on those of which great research significance is expected.

Empirical studies

Among the reviewed articles, approximately half of them were furnished with a certain degree of empirical work. These studies have covered a wide range of research focuses. In general, empirical research in construction partnering has four major themes as follows:

- project partnering (Larson 1995; Brooke & Litwin 1997),
- emphasizing a special application (Matthews *et al.* 1996; Pocock *et al.* 1996, 1997),
- having an international focus (Badger & Mulligan 1995; Sillars & Kangari 1997), and
- examining a dual partnering relationship (Nam & Tatum 1992; Weston & Gibson 1993; Hinze & Tracey 1994; Dozzi *et al.* 1996; Ruff *et al.* 1996; Puddicombe 1997).

Furthermore, some of these studies have more than one research focus. For example, Brooke & Litwin (1997) studied owner–contractor relationship in project partnering. The researchers emphasizing on these four research directions reflect that these directions are of particular importance to the current construction issues. First, project partnering has been widely applied in the construction industry. The more we know about it, the better would be the project performance. Second, construction partnering promotes the establishment of closer relationships between construction parties. Research on examining a partnering relationship helps to develop a more favourable connection. Third, in order to cope with the continued increase in the global construction marketplace, global partnering becomes a feasible solution (Badger & Mulligan 1995). Its feasibility relies on research focusing on the issues of international alliances. Finally, empirical studies help to collect useful data for specific purposes, such as the development of criteria for selecting partners or the validation of a scale for measuring project integra-

Table 3 A summary of the reviewed articles of the targeted journals

Article	Description	Remark
Agapiou *et al.* (1998)	Suggesting a logistics approach to the procurement process, which is expected to incorporate some of the principles of strategic partnering, such as collaboration and confidence between parties, active participation of top management, etc.	ne, sp
Thompson & Sanders (1998)	Development of a partnering continuum based on a reported empirical study (The partnering, 1996). Two dimensions of partnering continuum: potential benefits and degree of objectives' alignment. Creation of four general stages: competition and three approaches to partnering—cooperation, collaboration and coalescence.	ne, pm
Saad & Hancher (1998)	Partnering as a key component in a project management process model.	ne, pa
Brooke & Litwin (1997)	Identifying the best and poor predictors of success in project management; identifying critical management practices based on experts' views.	er, pp, pa
Crane *et al.* (1997)	Development of a five-step project partnering process model—internal alignment, partner selection, alliance alignment, project alignment and work process alignment.	ne, pp, pa
Lazar (1997)	Overview of research into issues of 'why' and 'how' partnering works.	ne, pp, pr
Pocock *et al.* (1997)	An extension to the study of Pocock *et al.* (1996) with a larger sample in military construction and the use of an additional performance indicator.	er, pp
Puddicombe (1997)	Examining the relationship between designers and contractors by means of comparing their responses to a set of perceived project critical dimensions.	er, pp
Sillars & Kangari (1997)	Examining criteria for the success of international alliances.	er, sp
Stipanowich & Matthews (1997)	A small but important section on strategic partnering that introduced the DART.	ne, sp
Dozzi *et al.* (1996)	Exploring the owner–contractor relationships in areas like contracting philosophies, methods of execution, contracting strategies, etc.	er, pr
Matthews *et al.* (1996)	Identifying the stages for selecting subcontractors using empirical data, resulting in the establishment of a semi-project partnering process.	er, pp, pa, pr
Miles (1996)	A description of partnering transcending to the next century being integrated with lean construction and TQM, with emphasis on describing the partnering team and how such a team is organized.	ne, pp
Pocock *et al.* (1996)	Developing and testing a project's DOI measure, verifying the relationship between DOI and performance indicators, and comparing the DOI scores of alternative management approaches to examine their degree of success.	er, pp
Ruff *et al.* (1996)	Examining owner–contractor relationships on contaminated site remediation projects.	er, pr
Badger & Mulligan (1995)	Examining reasons for and benefits gaining from forming international alliances.	er, sp
Crowley & Karim (1995)	Defining partnering in terms of the organizational interface that generates the interorganizational conflicts, and explaining different states of boundaries that give rise to different partnering forms. A new conceptual model of partnering with three forms of partnering—traditional relationship, formative partnering stage and partnering relationship with permeable boundaries.	ne, pm, ps
Ellison & Miller (1995)	Suggesting the formation of synergistic partnership where the parties involved anticipate a long-term strategic alliance that requires complete mutual trust. Construction of four levels of partnering—adversarial arms-length contractual relationship, collaborative team-oriented relationship, value-added integrated team and synergistic strategic partnership.	ne, pm, sp
Larson (1995)	The study of the effects of partnering on project success by a sample of 280 construction projects. The pursuit of project success by introducing the concept of project partners. Recognition of four working relationships—adversarial, guarded adversarial, informal partners and project partners.	er, pp, pm
Wilson *et al.* (1995)	Partnering as an organizational change process. Developing a strategic partnering process model.	ne, sp, pa
Abudayyeh (1994)	A case study to describe a change process for owner/contractor relationship. Project partnering as a three-stage process—interest in partnering, partnering workshop and construction execution.	ne, pa
Hinze & Tracey (1994)	Exploring the relationships between contractors and subcontractors by personal interviewing with 28 subcontracting firms. Questions were designed under the five main phases of subcontracting process.	er, pr
Loraine (1994)	Describing project partnering using economic views, arguing that project partnering has some long-term benefits.	ne, pp
Weston & Gibson (1993)	A survey to examine owner–contractor relationships in public-sector partnering.	er, pr
Woodrich (1993)	Discussing a controversial benefit of partnering as it relates to project control, by observing at an Air Force office to illustrate how a partnering agreement effectively controls a project.	ne, pp
Krippaehne *et al.* (1992)	Developing a vertical-integration matrix for organizations to select appropriate alliance strategy.	ne, sp
Nam & Tatum (1992)	Describing four noncontractual means of integration on construction projects: owners' leadership, the long-term relationship, employing integration champions and the professionalism of project participants.	er, sp
Bröchner (1990)	An early paper predicting the future development of project networks, including the possibility of integration of construction firms.	ne, pp
Cook & Hancher (1990)	An early paper suggesting partnering to be a future contracting strategy; a rich content describing the concept, definition and other key elements of partnering including the explanation of how partnering is related to organizational growth and competitive position.	ne, sp

er, empirical research; ne, non-empirical research; sp, strategic partnering; pp, project partnering; pm, partnering models (partnering approaches, partnering continuum); pa, partnering process; ps, partnering structure; pr, partnering relationship.

tion, which are seen as focusing on a special application of partnering research. The empirical studies on these four major themes are presented briefly hereinafter.

Research on project partnering

Larson (1995) examined alternative management approaches to project success using a large sample with 280 construction projects. For comparing the four types of owner–contractor relationship, he postulated six major criteria (meeting schedule, controlling cost, technical performance, customer needs, avoiding litigation and satisfaction of participants) to measure the degree of success of the relationship established in a project. Comparisons were also made between low-bid and non-low-bid projects. His findings supported the idea that partnering was among the most successful approaches to managing the owner–contractor relationship in both low-bid and non-low-bid projects.

Brooke & Litwin (1997) have been engaged in an on-going project management research for 20 years with data collected from seven large organizations (e.g. IBM and General Motor). They identified the best and poor success predictors of projects and critical management practices based on the experts' views, which can apply to construction projects.

Research examining a dual partnering relationship

There are several empirical studies examining a dual relationship within the context of construction partnering. Puddicombe (1997) tested the relationship between designers and contractors based on comparing their responses to a set of perceived project critical aspects. They concluded that although they rated equally in the first three major project goals (i.e. quality, cost and schedule) and showed positive reaction to others' conduct in interorganizational relationships, they differed in their answers to the selection of appropriate integration strategy and had diversified responses to the project success criteria. As a result, the disparity of their views was seen as the basis for their adversarial relationship. Nam & Tatum (1992) also stressed that there is a low degree of integration between design and production functions. Based on the analysis of ten completed projects (eight public and two private projects), they developed four noncontractual strategies to integration. These strategies are owners' involvement, developing long-term relationship, employing integration champions and establishing professionalism of project participants.

Ruff *et al.* (1996) studied the impacts of owner–contractor relationships on the performance of contaminated site remediation projects. Their results revealed that partnering, as one of the flexible project management strategies, is conducive to the successful completion of remediation projects. Dozzi *et al.* (1996) conducted a survey to collect data from the responses to a questionnaire and personal interviews, which is mainly to examine the current practices of owner–contractor relationships. One of their major findings indicated that partnering and its associated strategies (e.g. team building) have not been fully applied to effectuate the relationships, notably in the public sector. Weston & Gibson (1993) conducted a research examining owner–contractor relationships in public-sector partnering. Results showed that the performances are outstanding in cost change, change order cost, claims' cost, value engineering savings and duration change when compared with nonpartnering projects. They tended to support that partnering is a viable contract administration alternative for public-sector projects.

Hinze & Tracey (1994) studied the relationship between contractors and subcontractors through personal interviews with 28 subcontracting firms representing eight speciality areas, including painting, mechanical, electrical, drywall-plaster, masonry, utility, flooring and elevator. Subcontractors' views on five main phases of subcontracting process (bidding practices, subcontracting arrangements, administrative practices, payment procedures and project closeout) were collected and analysed. Results indicated that subcontractors (also known as speciality contractors) appeared to be placed in weak positions in a construction project. Subcontractors hardly examined the agreements with general contractors but just accepted the terms posed by the latter because they did not want the contract to be forwarded to other subcontractors who were willing to accept the terms. Subcontractors were assumed to take the risks that they would not otherwise assume.

Research having an international focus

There is a paucity of partnering research that has an international focus. Only two could be retrieved from the reviewed literature. For examining the characteristics of international alliances, Badger & Mulligan (1995) conducted 30 interviews with senior-level international construction executives. They further grouped the responses into seven functional areas (marketing, finance, operations, technical elements, management/personnel, labour and government) that defined all construction processes for the purpose of identifying

the criteria specific to each area. Other than some overall major criteria identified for the benefit of achieving successful international alliances, their findings revealed that each functional area represented a unique set of criteria for functional success.

Sillars & Kangari (1997) conducted a qualitative research where data were collected by means of interviews with three Japanese organizations that had international affiliates. Their findings implied that global changes were perceived to affect the way the construction parties must strategically plan to acquire new contracts. Factors like increased communications and availability of transportation are necessary for the construction parties to react rapidly to clients' needs for more efficient project delivery across national boundaries, so are such factors as political awareness, strength of resources, and current and efficient technology.

Research emphasizing a special application

Matthews *et al.* (1996) presented research that was done by a major national UK main contractor to use survey data (interviews and questionnaires) to design a selection process of subcontractors. The survey data helps to promote the expectations of contractor and subcontractors in order to improve the co-ordination of work between the two parties. The company established a semi-project partnering process that helps to set up procurement, design the selection criteria and finalize the selection and appointment of subcontractor.

Pocock *et al.* (1996, 1997), on the other hand, used empirical studies to validate a self-developed project's degree of interaction (DOI) measure. While they computed DOI scores for four approaches to project integration (traditional, partnering, design-build and combination), they calculated project performance in terms of cost growth, schedule growth, number of contract modifications and modifications due to design deficiencies (the last one was only used in Pocock *et al.* 1997). The results of the two studies generally supported the idea that project performance was enhanced when interaction occurred on a regular basis, beginning early in the project, in an open and trusting environment. Thus, DOI is a reliable measure. They further found that projects with higher DOI scores had more consistent performance indicators. Another finding revealed that partnering was an effective integration strategy over the traditional approach to increase project performance.

Nonempirical studies

As mentioned previously, nonempirical studies are mainly the conceptions or prescriptions of partnering. After the review of the literature, the authors identify four major research directions. These are: Types of partnering, Partnering models, Partnering processes and Partnering structure, which are described hereinafter.

Types of partnering

Within the target journals, there are two types of partnering—project partnering (relationships established for a single project) and strategic partnering (a long-term commitment beyond a discrete project). The advantages and disadvantages of both types of partnering can be found in most construction management textbooks (e.g. McGeorge & Palmer 1997).

Most of the reviewed articles have agreed that the two types of partnering are distinctive. Strategic partnering can secure long-term benefits, whereas project partnering fits for a single project. Loraine (1994), however, argued that project partnering has long-term economic considerations. For example, price competition has been perceived by most to 'pollute' the 'genuine' partnering relationship, but it may also be used to monitor construction quality and progress (Matthews *et al.* 1996). In addition, project partnering has no restriction on market entry and can therefore stimulate competition, which may have long-term benefits. In fact, the long-term benefits of project partnering are so few that they cannot outweigh its many short-term outcomes. Loraine (1994) stated that the challenge is how to allow such long-term benefits to operate in a nonadversarial relationship.

As the construction industry is dominated by one-off projects, it would appear that project-specific partnering will likely take the leading role in promoting a closer relationship in construction projects (Matthews *et al.* 1996). This is echoed by an earlier paper written by Bröchner (1990), who predicted that there is a need for the formation of project networks. In this network, members are all information intermediaries that support a single project. Indeed, this is so for the public sector, as partnering can only be promoted at the project level due to their competitive tendering policy (Woodrich 1993). Saad & Hancher (1998) further viewed that partnering is an effective management tool to navigate the project management process from the planning phase to the commissioning/start-up phase, via the design (including conceptual and detailed), procurement and construction phases, as it can be incorporated into each of the five phases.

Miles (1996) stated that the success of partnering relies on an effective partnering team. Lazar (1997), alternatively, identified four major barriers to partnering, which are external environment, organizational culture, organizational climate and organizational structure. These barriers have not been examined to what extent they would affect the construction partnering. Their utility would be queried without the support from empirical validation.

Pertaining to strategic partnering, Stipanowich & Matthews (1997) suggested the use of Dispute Avoidance and Resolution Task Force (DART) to change the culture of the construction industry by restoring the spirit of co-operation and teamwork. Agapiou *et al.* (1998) incorporated the strategic partnering concept into their logistics approach to the procurement process, which highlights the active participation of top management, long-term development of relationships between construction parties, the establishment of confidence and dependence between parties, etc.

Thompson & Sanders (1998) refers to strategic partnering as a coalescing relationship that involves re-engineering processes to fit cultural integration. The intention is to develop core competence in pursing the achievement of corporate and business strategies. Ellison & Miller (1995) used the term synergy to explain such a relationship. A synergistic relationship is one that seeks cultural furtherance of the parties that commit to modify the work practices and that have a desire and willingness to experiment with new models, approaches and means of solving problems to attain superior performance.

Krippaehne *et al.* (1992) suggested that partnering might improve vertical integration and maintain a company's competitive position. For example, partnering can be used to distribute risk between parties resulting in reducing the exposure of each entity while vertical integration internalizes risk (Cook & Hancher 1990).

Partnering models

Model development is valuable in shaping and describing the underlying concepts relating to the scope of research. It attaches meaning to various conditions of a doctrine, belief or principle. For example, partnering as a management concept might consist of various conditions in the relationship that would give rise to different approaches, constituting a partnering model. Authors who have developed models for partnering in the target literature include Crowley & Karim (1995), Ellison & Miller (1995), Larson (1995), Matthews *et al.*, (1996) and Thompson & Sanders (1998). These models promote different sets of description of the relationships among construction parties. The authors argue that there are different levels of partnering, which specify various relationship patterns between the construction parties. Their partnering approaches are in a continuum/spectrum, with each variation resulting in a separate application (Thompson & Sanders 1998). Among the reviewed articles, only two have presented how the model is derived.

Krippaehne *et al.* (1992) developed a framework for selecting vertical integration strategies from higher to lower levels of strategy—full integration, taper integration, quasi-integration and contracts (explicitly each reflect the degree of partnering; similar to the four levels of partnering identified in Ellison & Miller 1995). In order to survive in such a fragmented industry, construction parties must pursue appropriate vertical business integration as one of their core competitive strategies. The selection is based on three primary forces—bargaining power, current market niche (originally as business unit objectives), and industry volatility—which are the major industrial traits.

The work of Thompson & Sanders (1998) identified dual dimensions (business-driven benefits of partnering and degree of objectives alignment) for cross linking to produce four approaches to partnering, each of which (except the competition approach, which is not partnering in reality) has a specific application. The underlying concept assumes that the greater the long-term benefits and the higher the degree of goals/objectives, the higher the approach (or level) to partnering. Since other authors did not mention what criteria they used to develop their models, it is not possible to compare their used dimensions and to distil any critical comments based on them.

Partnering processes

Partnering is generally established through a structured, facilitated process that is designed to provide an environment, especially the use of workshops, for developing a co-operative atmosphere within the partnership (Moore *et al.* 1992). Essentially, a partnering process is a method systematically initializing, implementing and internalizing partnering concepts (Wilson *et al.* 1995).

The literature provides effectual solutions to overcome the problems associated with partnering. The processes that have been presented are diversified in their application. Abudayyeh (1994) suggests a three-step process to facilitate the construction performance

at the project level. The five-stage process model suggested by Crane *et al.* (1997) offers value to organizations for preparing to implement strategic partnering. Wilson *et al.* (1995) adapted a change process in implementing partnering. Matthews *et al.* (1996), on the other hand, presented a 'semi-project' partnering approach. The term 'semi-project' implies that the process involves limited competition, which should be avoided in genuine partnering that should emphasize negotiation but not competition.

Partnering structure

To date, research on partnering structure is not habitual. The study of Crowley & Karim (1995) is well known by its schematic representation of the partnering organizations. The diagrams intended to conceptualize the relationships between partnering parties. It aimed at focusing on the parties that were engaging in adversarial relationships and, by re-organizing their interface, fundamentally improve their ability to resolve interorganizational conflicts. More specifically, they described organizations in cell-like form, where the contact of their boundaries determines the level of partnering. These boundaries' deformation implicitly reflects the breadth, stages and types of partnering. Based on the nature of the boundaries, three types of relationships are in commonplace. Using a simple relationship between two construction parties as an example, the structures are described below:

1. The two parties are in arms-length distance, where their boundaries are protective and impermeable. This is called the traditional or contractual relationship. In fact, partnering has not been formed. This type of relationship is vulnerable and is the easiest to result in disputes and adversaries.
2. The boundaries of the two parties are deformed for the merging to occur. The united boundary is still impermeable, but some internal resources are re-organized by the individual parties and reserved for the 'group' to use (collective resources). This is called the formative partnering stage. An early form of partnering is initialized where some common features of partnering, such as trust and sharing of information, are emerged.
3. The third stage indicates that the merged boundary is permeable for the interorganizational exchange to occur. Trust is enhanced and a partnering organization is formed permanently. The united boundary becomes more permeable over time, resulting in the emergence of advanced features of partnering, such as implicit trust (Thompson & Sanders 1998), long-term commitment, shared vision and value, common goals, etc.

Their proposed partnering structure further delineates how the sensitive information will be leaking out and what trade-off will occur in the owner–contractor relations. Essentially, diagrams can see through the organizational interfaces and outline the flows of resources and information. The boundaries serve to distinguish between the primary goals (the goals of the partnering group) and the secondary goals (the goals of individual parties).

IMPLICATIONS FOR THE FUTURE

Research implications

The lack of rigorous empirical research in partnering has resulted in minimal improvements in our understanding of the concept. Primarily, this is due to a myriad of characteristics in construction that makes it hard to usher to an appropriate research agenda. Empirical efforts are crucial to explain the phenomena and test existing theories. By obtaining data from the construction field, 'real' construction theories can be developed. Thus, even opponents to certain theories might be convinced to become proselytes.

Empirical research has two traditional approaches—qualitative and quantitative. Supporters of the two camps have queried the usefulness of the other in construction management; e.g. Seymour *et al.* (1997) is in favour of qualitative research methods while Runeson (1997) is in favour of quantitative. Instead of joining in their debates, the authors believe that each approach has its own distinctive function. For exploring the nature of problems or drawing inferences from the data provided, a qualitative approach to research is advocated (Loosemore 1998; Loosemore & Hughes 1998). Upon probing any emerging patterns and commonalties leading to new theories and hypotheses, a quantitative approach should be used to examine them (either rejecting or supporting), without which no attempts would be made to validate causality or produce generic, universally applicable models.

The review presented in this paper has identified eight current research focuses (empirical and nonempirical). By all means, further research plans based on these efforts are recommended. Below is a list of some essential research problems awaiting empirical investigation.

Performance measures and critical success factors

One of the potential research objectives is to improve the DOI measure developed by Pocock *et al.* (1996). One of the criteria to compute the DOI score is to state the number of people to be involved in the interaction in each project phase. However, they assumed that the interaction of all personnel was equally valuable. As they suggested, assigning weights to these factors and examining their impacts on the DOI and its relationship to project performance should be undertaken. The analytic hierarchy process is a very useful technique to weigh the factors (Saaty 1980). In addition, for developing a more generic measure, a larger sample is needed to support the findings. They also admitted that the performance indicators they used were not comprehensive measures of project performance. Further studies can be performed to identify the critical performance indicators. Especially when many reviewed empirical studies have accredited project performance as an important indicator of the success of the project (e.g. Weston & Gibson 1993; Ruff *et al.* 1996), to validate the performance indicators, such as schedule, cost, quality and safety, is of particular importance. For other performance indicators (or positive outcomes), refer to Appendix A. Other potential performance measures can be found in Faniran *et al.* (1998), who provided a list of four sets of variables and measures, namely the construction-planning effort, construction-planning effectiveness, project environment and organizational characteristics, where key supporting literature for each variable was also given.

Badger & Mulligan (1995) and Sillars & Kangari (1997) qualitatively identified different sets of criteria that were likely to influence the success of global partnering. To validate these criteria and examine the degree of their impacts on partnering success, quantitative research should be undertaken. The deductive approach to research can examine and ascertain the hypothesis or proposition by determining if there are any significant results. Large samples are needed for drawing meaningful comparisons (Larson 1995). In addition, their methodology for developing success criteria can be applied to other partnering studies, e.g. to identify a set of criteria for successful strategic partnering. The 'diary' methodology used by Loosemore (1998) and Loosemore & Hughes (1998) is an alternative to collect interacting data, which can be used to explore any pattern or commonality of success characteristics of construction partnering.

Larson (1995) compared alternative management approaches to project partnering using a large sample. Although he quantitatively found that partnering was the most successful to manage the owner–contractor relationship, he stressed that such a partnering relationship might not be existent throughout the whole project. For examining any changes in the relationship that occurred during the course of a project, data from individual construction phases should be collected and analysed. Some researchers have identified five (Saad & Hancher 1998) or six (Pocock *et al.* 1996, 1997) phases of a construction process, or even ten important elements in project management (Sanders & Moore 1992). Success criteria are also likely to be varied in different functional areas of the construction project (Badger & Mulligan 1995). These arguments are worth considering in future research design.

There are likely to be some key characteristics that can be controlled to drive the potential for a successful partnering relationship (see Appendix B). To identify these characteristics and associated critical factors (see Appendix C), research should be undertaken to not only know what partnering does, but why (Lazar 1997). Brooke & Litwin (1997) identified the best and poor success predictors of projects. As the time span of their research was too wide, it is crucial to test if 'time' would be a predictor of the response patterns. For example, the variable 'time' (by grouping the data in four subsets of 5 years each) can be tested (e.g. *t*-test) in its relationships with the project predictors. Researchers have to explain if any significant relationships appeared (because 'time' is likely to affect those project predictors if their *t*-test results are significant). In order to test a set of constructs/factors that affect the partnering success, the methodology used in other disciplines may be helpful to the construction field. Mohr & Spekman (1994), Parkhe (1993) and Rai *et al.* (1996) are some representative examples to investigate the characteristics and the process of partnering in other business environments. They are recommended to be adapted to the research context in construction.

Other than studying the critical success factors of partnering, research is recommended to test the organizational barriers to partnering suggested by Lazar (1997), which are: external environment, organizational culture, organizational climate and organizational structure. Aspects of these barriers should be identified. For example, politics can be a source of external barrier, which may affect the outcome of a decision. Testing of these barriers involves the use of measures with items created from their underlying concepts.

Development and test of partnering models and processes

With respect to partnering model development, the existing studies have created different levels of partnering that are in a continuum/spectrum. As such, the following questions should be addressed:

1. Are there any other forms of relationships? Model development usually involves the use of dimensions to determine different conditions of relationships. Future research may consider other useful dimensions, such as shared resources/information, efforts and outputs of the interorganizational team, and potential risks to partnering, to examine the validity of the existing models and possibly create other forms of relationships.
2. How can models be validated? Empirical testing is highly recommended. Quantitative research to validate hypothesis or proposition is not common in the extant partnering literature. For the generalization of theory, data collected from within the industry should be undertaken. Using the example of Thompson & Sanders (1998), response data from a sample of partnering team members regarding their perception on what benefits and goals would tie to each level of partnering can be plotted on the graph to ascertain the accuracy of the straight-line curve representing the partnering continuum. Any deviation may be explained by a more detailed research design that has been considered and constructed beforehand or that would be used in further research.
3. What factors affect the choice of partnering? How effective was the partnering method? Which is the most appropriate method?

There is an emerging research focus on exploring the issues of 'how' and 'why' the partnering process works (Lazar 1997). Lazar (1997) (p. 76) states:

> "The goal of this line of research is to increase the likelihood of successful partnering experiences for both owners and contractors through a heightened understanding of how to fine tune the partnering process for environments where partnering might otherwise not succeed."

When there is a need for a different way to manage new interorganizational relationships formed by the assurance of better economic outcomes (which is called 'second wave' partnering), further questions have to be asked. Thus, which partnering processes will need to change? What kinds of changes will be necessary?

Among all reviewed process models, Matthews *et al.* (1996) provided a useful framework for contractor–subcontractor partnering. It highlighted the importance of using surveys, including informal interviews and questionnaires with people of the contractor and subcontractors to identify the most prevalent benefits of partnering. The intention was to develop a set of procedures to select and appoint subcontractors.

In addition, the five phases (bidding practices, subcontracting arrangements, administrative practices, payment procedures and project closeout) of the subcontracting process and the questions that address the aspects of each phase are helpful to study the contractor–subcontractor relationship (Hinze & Tracey 1994). The work of Brooke & Litwin (1997), although not purely construction research, also emphasized the use of organizational and practices data from executives, managers and subordinates to identify the key trends of partnering practices in project-based industries like engineering and construction. They investigated what were the best and poor predictors of success in management and influence practices, which formed the basis to search for the best practices (i.e. criteria for success) to partnering project. Both of these two studies are worth employing in other research.

Researchers are recommended to affix the framework of Matthews *et al.* (1996) to other studies that attempt to identify the procedures for client–general contractor, client–consultants and general contractor–consultants relationships. The key component is to understand what a party wants from the other. The match between the expectations of one party and the other not only helps to select the partner, but also forms the basis for future development of common partnering goals and objectives. On the other hand, researchers are encouraged to use the methodology of Brooke & Litwin (1997) to identify the criterion measures for various partnering applications. Adapted from their suggestions for internalizing partnering parties, some criteria are derived that are conducive to intraorganizational practices. In implementing a partnering arrangement:

1. Managers should give subordinates feedback on how they perform under the new state of work.
2. Managers should understand and be able to explain the partnering mission, and know how it influences all kinds of jobs from within the organization.
3. Managers are willing to make tough decisions in implementing the partnering strategy.
4. Managers behave in a way that leads others to trust their partners.

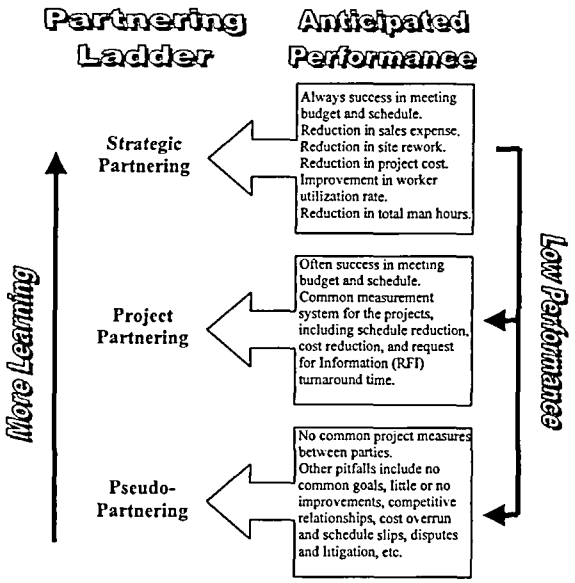

Figure 2 The ladder of partnering (sources from Matthews *et al.* (1996) and Thompson & Sanders (1998)).

These criteria for success need to be investigated to determine their relevance to construction organizations. Further research should also be undertaken to explore other critical factors that affect the intraorganizational practices to form an alliance. Brooke & Litwin's (1997) methodology, therefore, would be effectual.

The formation and selection of partnering strategy

A learning life cycle is crucial to not only improve construction performance but also to build a much closer relationship. Saad & Hancher (1998) provided a multimedia system called the Project Navigator, which is an effective method for tracking progress on a construction project as well as documenting the lessons learned from the project in a multimedia format for future reference by different project team members. It is purposely built for project performance improvement. Yet, is it possible to expand its applications? With certain modifications of the existing method, will it be able to effect the functions of learning experience to develop closer relationships between construction parties? These questions are recommended to incorporate into future studies. The development of a process for guiding the move from project to strategic partnering is worthwhile. For example, under what conditions an organization is able to form a closer affinity with other parties? How to achieve and sustain such conditions? One of these conditions might be the creation of higher anticipated results. How will these results be shared to enhance the mutual profitability of the parties? Attempting to answer these questions may explore the learning necessary for establishing intimate relationships.

Pertaining to the reviewed literature, it is likely that a formal strategic approach in organizational planning is unusual in construction. Its lagging behind other industries is due to the intensely project driven and the cyclic nature of the industry, and their traditional expectation for immediate or short-term results (Krippaehne *et al.* 1992). They, therefore, developed a vertical-integration matrix (as mentioned in previous section) for organizations to select appropriate alliance strategies. Although they urged for construction endeavours to refine their matrix, no active researchers had attempted this (as shown in the reviewed literature). They further argued that there should be some factors critically affecting the vertically integrated strategies. They identified five of them—rate of technological change, excess capacity, equipment-in-demand, construction-industry sectors serving and strategic flexibility. Future research should examine the extent to which these factors will influence the partnering strategy formation, and identify if there are other critical factors to add to form new matrix models. In fact, an effective matrix is very useful for practitioners as it provides a visual explanation of the possible solutions and renders a quick response to a problem.

Practical implications

After reviewing the models in the targeted literature, three major relationships (pseudo-partnering, project partnering and strategic partnering) are identified. These levels of partnering are similar to those of Matthews *et al.* (1996), who further stressed that by learning about the practicalities of partnering, an alliance can climb up the ladder as shown in Fig. 2. Low performance might result in 'rolling' down the ladder. In addition, each level of partnering requires a different set of performance measure tied to the band of performance to attain. These relationships are described hereinafter.

1. The 'pseudo-partnering' relationships that are created for the execution of a project have been supported by all models that it is maintaining in an arms-length distance (e.g. Crowley & Karim 1995). Ellison & Miller (1995) called it the adversarial arms-length contractual relationship. Thompson & Sanders (1998) referred to this relationship as the traditional construction relationship that raises competition among involved parties; at this level,

partnering cannot be found. Parties' relationships are defined by the contracts for the purpose of solely completing a construction project. At this stage, some common characteristics include:

- each party has defined responsibilities (as stated in the contract) and abides by the contract only;
- clients (or developers) always execute their coercive power to monitor and inspect contractors;
- all parties look for short-term benefits and pursue their own concern at the expense of other parties;
- they have no common objectives and goals, little or no trust, no shared risks, no shared vision, etc;
- they often confront each other creating adversarial relationships, and often create disputes or even litigation;
- considerable time and energy is devoted to legal protection against claims from other parties; and
- the construction parties are strong in bargaining power (thus they do not need to integrate with others) or focused in narrow market niche (thus they can retain their competitiveness without sharing their expertise with others).

2 Project partnering is the most popular because it suits every single project. It is widely promoted in the public domain (e.g. Weston & Gibson 1993). In the project partnering relationships, parties have common objectives that are project specific. Trust has started to establish. More communication and understanding among parties are expected. Interorganizational relationships have been improved. More effective decision making process is evolved (Wakeman 1997). However, different authors have different views regarding this stage of the relationship. Thompson & Sanders (1998) referred to this as the co-operation stage. Ellison & Miller (1995) subcategorized this stage into collaborative team-oriented relationship and value-added integrated team while Larson (1995) used the term informal partners and project partners. When conforming to the partnering structural model of Crowley & Karim (1995), this should be the formative partnering stage where the boundaries of the parties merge together and become permeable. The permeability of the boundaries can be adjusted to cater for the specific needs of the project and the parties themselves, resulting in the shift of modes within this stage. In conclusion, this stage has other characteristics, which include:

- co-operation between parties extends beyond the signed contract;
- an interorganizational team is supposed to be established;
- information, resources and even risks are shared among all parties within the team;
- claims and win-lose mentality are replaced by incentive and mutual give and take, respectively;
- project objectives are clear and accepted by all parties;
- for a higher level of project relationship, the team should develop a longer term of partnership, a set of goals beyond individual project objectives and a set of partnership measures different from those used on individual projects; and
- the higher the level, the more the cohesion of the team members, approaching to the formation of an integrated team, which needs trust and accepts collective accountability.

3 The strategic partnering is increasingly encouraged by updated published work. It requires a long-term commitment and trust by the parties involved to extend their relationships beyond the successful completion of a single project to the formation of an alliance. This alliance further extends its concern on project-related matters to performance improvements in terms of products, services and work practices/processes, intending to achieve the missions on high quality and core competence resulting in the ultimate goal of customer satisfaction. As a major company strategy, it helps to attain a competitive advantage (Krippaehne *et al.* 1992). It further plays an important role in determining the future growth of involved organizations, especially the formation of international alliances to survive in the global marketplace (Modic 1988; Badger & Mulligan 1995; Scott 1995). For learning how to formulate strategy in construction, refer to Junnonen (1998).

Again, this level of partnering has been translated diversely by different authors. Ellison & Miller (1995) referred to this as the synergistic strategic partnering. Thompson & Sanders (1998) subdivided this into collaboration and coalescence substates. In this state of partnering, the boundaries between the parties are more permeable, which allows them to pass through more resources (e.g. information) for sustaining the characteristics/requirements of a higher state of relationship. Nevertheless, new partners will not come to

this state so early. They need to know and experience others concerning their preference styles of work and management, and share among themselves with their missions, values and visions. Should there be no common or compatible interorganizational goals and objectives, no advanced partnership can be formed. For achieving this state of relationship, some points are worth noting, which include:

- the construction parties are usually weak in bargaining power, so they need to form a strategic alliance to strengthen their competitiveness;
- the parties should have a common focus on long-term rather than short-term benefits;
- an interorganizational team must be formed that should be composed of senior executives of the involved parties, who should have a thorough understanding of the practice of their own organizations and are authorized to vote on behalf of their top management;
- for the team to work productively, some contextual characteristics should be present, such as high trust, equal partnerships, sharing of meaning and information, mutual benefits, long-term commitment, extensive communication, total management support, etc;
- independent measuring systems should specifically cater for the projects and the alliance/relationship;
- the relationship-specific measures should attach to some incentives especially delivered to the team members; and
- the team should look for opportunities for major breakthroughs, which tie to excellent project and organizational performance.

With respect to the partnering process models mentioned previously, which are so diversified that it is difficult to dig out a one-off solution from them. Instead, this paper would present a partnering process that attempts to present some useful solutions to various applications based on the reviewed papers. For more detailed guidelines or prescriptions on implementing partnering, refer to Hellard (1995), CII Australia (1996), and Ronco & Ronco (1996). The process presented here is *au fond* efficacious for those who want to climb up the ladder. It envisages that partnering should be formed step-by-step, from lower to upper level. Also, the speed of moving from one step to another must be conformed to the viability of the organization and the expectations of the top management. The viability of the organization is measured by its current state of resources in terms of finance, manpower, expertise, equipment and technology. The expectations of senior management are derived from their vision, mission, values and goals (Mink *et al.* 1993). The process introduced hereinafter exhibits the common tactics of partnering formation.

1. *The introduction of partnering to organizations*
   - making them acquaintance to partnering;
   - developing their interests in partnering; and
   - employing a facilitator (optional) to manage the process.

2 *The identification of the needs for partnering*
   - defining the future state, based on the organization's vision, mission, values and goals—some refer to this as identifying the business drivers;
   - performing a comprehensive self-analysis, i.e. the current state of the organization;
   - comparing the current and the future states to highlight any performance gap; and
   - evaluating if partnering is the best means to fill in the gap.

3 *The selection of the partnering companions*
   - forming an empowered selection team;
   - developing a list of partner selection criteria or measures; and
   - understanding the expectations of the linking party (e.g. relationships of client–contractor, contractor–subcontractors, etc.) toward their partners.

4 *The organization of the partnering workshop*
   - establishing an interorganizational team;
   - developing the esprit de corps; and
   - agreeing to set up something in writing during the workshop—a charter for a project partnering or an agreement for a strategic partnering.

5 *The development of the partnering value/culture during the workshop*
   - developing the alliance common goals and objectives;
   - developing the alliance performance measures;
   - establishing the alliance reward system; and
   - including all the above establishments as statements written in the charter or the agreement.

6 *The mobilization of the internal work process*
   - developing internal goals of each party; and
   - establishing processes to effect the measures.

7 *The execution of the project*
- setting up some responsible subpartnering teams to co-ordinate and monitor the tasks and make sure that the partnering works smoothly and successfully.

8 *The repetition of the cycle*
- establishing a learning climate throughout the process; and
- accruing learning experience for the quantum leaps in performance or the advancement in relationship. As previously mentioned, climbing up the ladder requires learning about the practicalities of partnering. For managing a learning life cycle for performance improvement, readers may refer to the Project Navigator system developed by Saad & Hancher (1998).

Recalling of a previous statement that organizations today want to maintain their viability for the purpose of satisfying clients' demands, construction parties should enhance their competitiveness and constructability. As the construction projects become more internationalized, in order to sustain competitive position in the global construction industry, three suggestions are devised here (Sillars & Kangari 1997):

- preparing to work globally through political awareness;
- assembling required resources to meet clients' needs; and
- providing the most cost-efficient and client-responsiveness technologies.

CONCLUSIONS

The review provided in this paper has 'polished the signposts' and offers new directions for partnering research in construction. During the last decade, guidelines and models for implementing partnering in construction were developed that focused on both empirical and nonempirical research, each of which appeared to have four major themes. The four major empirical research themes are project partnering, examining a dual relationship, international partnering and a special application of partnering. Nonempirical research and studies, alternatively, focus on the types of partnering, partnering models, partnering processes and partnering structure. Moreover, the authors suggest that future research should focus on empirical studies of the following directions: investigating better performance measures and critical success factors, developing and testing partnering models and processes, and formatting and selecting partnering strategies.

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APPENDIX A: PERFORMANCE INDICATORS OF PARTNERING

Thompson & Sanders (1998)	Expedite work processes Reduce supervisory activities Eliminate redundant
Puddicombe (1997)	Met quality specifications Met schedule Minimal surprises No claims by owner Safety No claims by contractors Produced cost savings for owner Met general contractor profit Met subcontractor profit
Weston & Gibson (1993)	Less cost and schedule growth Fewer claims and change orders

APPENDIX B: KEY PARTNERING CHARACTERISTICS

Team building
Conflict revolution
Effective communication
Mutual goal and objective development
More value engineering
Long-term commitment
Mutual respect
Mutual trust
Innovation
Shared vision
Integrity/equity
Freedom of speech and openness
Sincere cooperation
Shared risk
Ethics
Win-win attitude

Sources from Abudayyeh (1994), Weston & Gibson (1993), and Wilson *et al.* (1995).

APPENDIX C: ATTRIBUTES OF SOME KEY CHARACTERISTICS OF PARTNERING

Key characteristic	Associated attributes
Mutual trust	Developing confidence Encouraging open communication Exchanging ideas Sharing of resources
Long-term commitment	Constant improvement of technology and methods Reinforcing the mutuality of the parties Reducing the rivalry of the traditional contracting system Reducing the attractiveness of litigation Producing feelings of camaraderie among the parties
Shared vision	Setting common project objectives and goals Alliance formed by consensus through open expectations Alliance established within a candid environment
Win-win attitude	Neither party wins due to the other's loss
Conflict resolution	Differences expected to be jointly held problems but not individual disputes
Freedom of speech and openness	Parties being encouraged to identify and address problems
Innovation	Open exchange of views and ideas solving day-to-day problems
Equity	The needs, concerns and objectives of each party being cooperatively addressed
Shared risk	The uncertainties of project life being jointly shared

Source from Crowley & Karim (1995).