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The engineering or evolution of co-operation? A tale of two partnering projects

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Abstract

Accounts of the development of partnering in construction often stress the importance of formal mechanisms for 'engineering' collaboration and underplay the impact of social dynamics on the development of the relationship. Drawing upon case study evidence from two very different partnering projects, this paper examines the ways in which the nature and quality of relationships between client and contractor depend upon a complex and dynamic interplay of formal integrative mechanisms and informal social processes. The paper draws out a number of key implications for understanding partnering in practice. First, that attributing project success (or failure) to partnering is by no means a straightforward exercise. Second, that there is no one strategy or template for effective partnering. Third, that partnering is a dynamic process, involving short-term learning and mutual adjustment. Fourth, that wider organisational structures and cultures often have an impact upon partnering relationships. Finally, that partnering does not necessarily resolve project problems at source.

Keywords: Construction; Partnering

1. Introduction

The spread of partnerships and alliances in construction in the last decade has ushered in something of a sea change in behaviour across certain parts of the construction industry. No longer content to accept shortfalls in project performance associated with fragmentation and conflict, clients have increasingly looked to alternative ways of working with contractors and other members of the project team. The result has been the development of partnerships and alliances in various forms, all of which have the aim of aligning project objectives to common business goals in order to create more co-operative and productive working relationships [1,2]. Reinforcing these practical developments have been a number of policy initiatives that have stressed the importance of improving collaboration and integration across the supply chain [3,4]. There is now also an extensive and growing research database on the suitability and efficacy of partnering in practice [5–7].

Despite this attention, however, there remain several important unanswered questions about the development and implementation of partnering in practice. Most of these questions revolve around the notion that partnering and alliances require a change of culture within the industry — away from a reliance upon adversarial ways of working and towards the development of relationships based upon co-operation [8]. One important question here is whether or not partnering actually does reflect a deep-seated change in attitudes within the industry, as opposed to a more calculated and superficial response by contractors to particular market conditions?. Another important question is how such cultural change can be brought about, given what we know about the subtleties of organisational culture and the complicating effects of contractual relationships? [9].

Despite the importance of these questions for understanding partnering in practice, there is comparatively little research available that attempts to provide any answers. The literature is certainly replete with case study examples of successful partnerships and alliances. However, there is very little work available that analyses partnering in sufficient empirical depth to examine

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processes of cultural change properly. Instead, the literature is notable for the proliferation of reports, manuals and 'toolkits' that have accompanied the spread of the partnering phenomenon [10–12]. Although these provide useful additions to the armoury of information about partnering, their highly prescriptive nature limits their value in helping understand how partnering works in practice.

What is needed therefore to complement the growing number of proposed solutions to the problems of collaboration, is research that takes a step back to examine in more depth how these solutions actually work in practice and what constraints and difficulties need to be overcome in implementation. This paper is an attempt to present such more in-depth, critical research that examines the strengths *and* weaknesses of partnering in practice. It does so by presenting a comparative analysis of partnering on two selected case study projects.

2. The engineering or development of cooperation?

There is of course considerable debate about the range of practices subsumed under the 'partnering' label, with some commentators arguing instead that partnering involves making progress across a number of technical and organisational fronts [7]. However, the principles of partnering are fairly well set out in the literature. Partnering is not simply a set of practices or techniques, but is about changing attitudes, as well as behaviour [5,8].

Yet much of the literature tends to presume or imply that implementing partnering is essentially a *technical-managerial* problem, involving the application of appropriate tools and techniques to bring about changes in motivations, attitudes and expectations [1,11,12,13]. According to this approach, the required transformation in culture is achieved through the application of an armoury of techniques such as rigorous selection procedures, formal teambuilding exercises and appropriate financial incentive systems. Formal integrative mechanisms, such as charters, dispute resolution procedures, teambuilding workshops and the use of facilitators are thus seen as central to the inculcation of collaborative norms and values. Complementing these mechanisms are a raft of performance improvement practices, such as incentive systems, continuous improvement programmes and benchmarking, all of which are intended to realise the gains from collaboration and reinforce co-operative behaviour.

It is therefore presumed that co-operation can effectively be 'engineered' in the short term and systematically constructed in the long term. Partnering will 'work' in the first place, provided the right mechanisms are in place and provided there is sufficient senior management support for the idea and a willingness to see it through. In this scenario, the benefits of partnering become self-evident and a virtuous cycle of co-operation is reinforced as the partnering relationship matures over time and expectations of performance gains are realised (or a vicious cycle of conflict sets in if problems are experienced).

Although some do stress instead the more informal and developmental aspects of partnering, it is clear that discourse within the sector is heavily skewed towards the role played by formal mechanisms [8]. Perhaps this reflects the positivistic approach that dominates the literature and which is symbolised in the 're-engineering' logic that has underpinned many recent cultural change initiatives in construction [14]. Whatever the explanation, it is clear that such an emphasis on tools and techniques underplays the important *social* dimensions of partnering in practice and the complexities and dynamics of relationships between organisations and individuals [8]. For example, co-operation may ostensibly be high where both companies have positive reputations for their collaborative approaches. However, this apparent cultural compatibility can co-exist with, and even be undermined by, lack of co-operation at an interpersonal and/or operational level. Whatever the scenario, it is evident that partnering can develop along a number of different possible trajectories, with various implications for the quality of relations and eventual performance outcomes. It is therefore important that research begins to complement what we know about the 'mechanics' of partnering with a more sophisticated understanding of the informal practices and processes involved in a partnering arrangement.

3. Research aims and methodology

The research reported in this paper was undertaken to explore the factors that promote or inhibit the development of partnering and similar collaborative relationships [15]. The research explored both formal and informal aspects of partnering: formal aspects included the use of agreements, contracts and incentives, contractor selection procedures and formal teambuilding and facilitation; informal aspects included the styles of organisation and management adopted and project team dynamics. In addition, the relationship between the project team characteristics and broader structural-cultural attributes and human resource management practices within each firm were examined.

The data reported here consists of two case studies of relatively large-scale partnering projects undertaken by experienced clients in two sectors of the industry (civil engineering and process plant work). This paper concentrates upon these two particular projects because they offer a chance to juxtapose two very different approaches to a long-term partnering-based procurement

strategy — one based on very formal systems and procedures, the other based on informal and developmental processes. Both projects can also be regarded as having been successful. Both were on schedule and budget at the time of research; staff on both projects could give examples of savings made and claims avoided; and clients and contractors all expressed general satisfaction with the processes involved and the quality of relations.

The data were drawn mainly from semi-structured interviews held with about 18 team members in each case. Respondents included a selection of team members from different departments and levels within each main participating organisation (client, designers, main contractor), as well as interviews with some subcontractors' representatives (thus allowing the exploration of any alternative perspectives). Interviews were conducted over a 1-year period and tracked through developments in each project from its design stages through to construction on site.

All interviews were based on a nine-page common interview schedule, which included questions on the nature and objectives of the project; project management structures and systems; methods of procurement and contractual arrangements; staffing, organising and team building practices; and project performance criteria, measures and outcomes. The resultant interview transcripts (nearly 120 pages in total for the two cases) were coded manually to capture data on common themes and issues and unique circumstances and events across the cases.

4. Project B: the airfield services project

This project was a £20 million contract for the provision of airfield civil engineering services, that formed part of a 5-year framework agreement between the client, an airport company, and a major engineering contractor. The framework had been agreed in November 1995 and the total planned capital spend was £150 million over 5 years from 1995–2000. The project was let under a NECC form of contract, based on a negotiated target cost with a risk/reward element.

The client had opted for a partnering arrangement with the principal aim of making substantial reductions in capital costs, but also to enhance its ability to meet the needs of end-users (airlines, passengers) in the provision of quality services. Safety, security, lack of disruption to ongoing services, as well as other important regulatory requirements, were also seen as key performance indicators. The aims of reducing capital expenditure and meeting customer needs more effectively had been made explicit in many of the public pronouncements of the company's chief executive and had spread to virtually all aspects of supply provision within the company. This framework was the first of its kind and so seen as something of a 'trailblazer' within the organisation, particularly given the lack of an existing blueprint for working collaboratively with contractors. Global targets established for the 5-year duration of the framework were to reduce costs by 30%, programmes by 40%, to increase cost and programme predictability to 95% and to reduce the accident rate to 0.5/100,000 man hours. The longer-term aims of the relationship included eliminating duplication, improving communications and integration between client and contractor and promoting continuous improvement.

From the contractor's point of view, there were obviously very significant direct commercial benefits of winning a planned workload of £150 million over 5 years. The continuity of work would enable better planning and allocation of resources, more predictable cash-flow, improved cost recovery and relatively secure margins. The chances of winning subsequent framework awards would also be increased and there were more intangible marketing and strategic benefits, associated with the opportunity to develop further experience and expertise in partnering-type work with a major and highly prestigious client. Not surprisingly, therefore, partnering was supported from the very highest levels within the firm.

4.1. Selecting a partner

From an early stage, the client recognised the need to put considerable effort into selecting a suitable partner. The entire selection process took in excess of a year. However, given the number of projects carried out under the framework, this represented a significant saving on tendering costs compared with traditional competitive tendering. Moreover, it was felt that important lessons were learned that could be applied to subsequent framework awards.

The process was a multi-stage one and very intensive, consisting of preliminary and more detailed questionnaires, presentations, interviews and site visits and the sample pricing of four jobs. In assessing the bids, the client used geared weighting of multiple criteria, which included not only conventional factors (such as commercial stability and technical skills), but also others. In particular, emphasis was placed on cultural attributes and compatibility was measured through company visits, textual analysis of responses and 'scoring' of companies according to an established set of attitudinal criteria. The cost element comprised only 40% of the total score and, crucially, tenderers were advised not to try to 'buy' the contract. They were also expected to display a strong appreciation of the possibilities open for strategic development within the framework, as well as a 'deep' understanding of partnering (rather than simply 'going through the motions'). Those who were to be actually involved in the framework agreement were also expected to attend presentations/interviews.

4.2. Building the relationship and integrating the team

With the focus being on making the selection process as rigorous as possible, there was little consideration of how the framework would actually be organised and so the initial period of team formation involved a steep learning curve. This was compounded by the fact that upcoming projects, postponed in anticipation of the framework agreement being finalised, suddenly came on stream creating a high workload in the early months and throwing the team into 'fire-fighting mode'. Consequently, there was some delay in bringing the team together. This early problem was addressed at the start of 1996 with three facilitated workshops which brought together staff at different levels within the team, and which helped clarify project aims and objectives as well as processes and relationships.

In the early stages, however, client and contractor members of the team tended to relate primarily to their own groups, communications between the two groups were poor and there was some confusion about the division of roles, responsibility and authority. Attitudes towards the use of workshops to improve integration ranged from skepticism to enthusiasm, the balance of opinion suggesting that they were seen as necessary, but not sufficient, in that communications improved mainly through ongoing day-to-day interaction.

Co-location of the design team with the management and construction teams was universally regarded as beneficial in bringing the team together, permitting greater accessibility and allowing more timely and informal communications. However, this occurred only after about a year of the framework coming into effect and there was also a recognition of the potential disadvantages, including the danger of disruptive 'over-communication'. Nevertheless, co-location was seen as a success and helped sustain a level of team cohesion that was further enhanced by other activities. These included regular 'away days' to address specific issues, informal social events and a team newsletter to encourage feelings of 'ownership' and highlight individual and team achievements.

With regard to project team staffing, active attempts were made to select people with appropriate attitudes, skills and experience, although availability proved to be an important limiting factor. There was some reshuffling of team members and relocation to other jobs for those exhibiting confrontational attitudes or behaviour. However, a steady turnover of staff was seen as endemic to this type of work and not necessarily a disadvantage, since it helped to 'freshen up' the team. When new members joined, conscious efforts were made to integrate them into the team.

4.3. Styles of organisation and management

Due to the high early workload, little attention was given to how the team would be organised and how its procedures would operate. This led to a reproduction of many conventional features of project organisation, including very traditional roles for quantity surveyors, resident engineers and clerks of works. This more conventional organisation was replaced though by a more integrated division of roles and responsibilities, which reduced duplication and helped the team become less of a command-and-control style of organisation. However, areas of duplication still remained, especially with regard to cost management functions.

The client's internal matrix structure comprised dedicated project teams and process streams/functional areas, with the latter ostensibly in a supporting role. Ongoing efforts were needed, however, to maintain a balance between project and functional objectives and orientations. The project team was also affected by the adoption by the client of business process mapping techniques, implemented with the aim of streamlining activities and eliminating waste across its entire range of operations. The business process mapping was based on a strict sequence of consultation, decision-making and financial gateways. Although some felt it was a necessary step in establishing discipline over a hitherto unstructured decision-making process, others felt that it introduced unnecessary rigidity and created delays.

The client was a large, complex organisation with a wide range of internal stakeholders with potentially conflicting demands. In the early stages, the project team encountered some difficulties in negotiating this complex organisational terrain and representing its point of view to a wider constituency. This led to the appointment of a general manager to engage with the internal decision-making process, establish closer links with stakeholder groups, and improve understanding of the pressures facing the project team. Evidence of the success in handling the interface between the team and other internal stakeholders was seen in the negotiation of more favourable site access conditions from operations staff. However, some difficulties and constraints remained in dealings with stakeholder groups, reflecting differences in priorities and understanding. Despite the discipline of the business process approach, there were difficulties in achieving early and definite decisions from stakeholder groups and, at times, these delays affected progress on the project.

4.4. Overview of the project

In short, this project was one in which there was a sophisticated approach to selection and incentivisation, but early team problems caused by the pressure to get on with the projects and the rush of enthusiasm for partnering. These problems included conflicts and uncertainties within the team and the use of a very traditional command and control structure in the early stages. The situation was steadied with more attention

being paid to teambuilding and other forms of integration (although there was some skepticism about both). The appointment of a manager to handle the complex and highly political internal interfaces with client stakeholder groups was unanimously seen as beneficial, although it was evident that the partnering approach sometimes conflicted with the client's complex internal procedures and well established culture. Overall, there was a crucial appreciation that establishing the framework was an ongoing learning process with no 'final destination' and that effective processes and relationships did not automatically fall into place.

5. Project E: the air separation unit

This project involved the construction of an air separation unit for the supply of industrial gases to an industrial user. The total cost of the project was approximately £80 million, with a duration of 20 months. The client, who supplied the industrial gases, and the main mechanical services contractor were involved in a long term alliance agreement for the supply of mechanical construction services for client projects across Europe. This particular project involved a reimbursable contract, based upon a negotiated target cost with incentives included via a risk/reward formula tied to the overall cost of the works (not simply the mechanicals package).

The decision to establish an alliance was the result of the client's previously very negative experiences of more traditional contracting, which had involved frequent cost and schedule overruns, confrontation and claims. Coupled with this was a determination to improve project cost and time performance as part of wider company initiatives to improve competitiveness. The company had committed itself to global targets of reducing capital costs and schedules by 25% over 3 years. The establishment of an alliance with the contractor, it was felt, would improve schedules, mainly by eliminating the repeated need for lengthy tendering procedures. However, significant cost reductions were also expected and important performance indicators included meeting quality and functional specifications and safety, environmental and planning requirements.

As for the contractor, again there were obvious benefits in being involved as an alliance partner, including continuity and the expectation of follow-on work. In particular, there was the possibility of gaining privileged access to an important niche market which comprised a substantial proportion of the contractor's annual turnover.

5.1. Selecting a partner

Support at senior levels within the client was echoed by champions at senior level within the contractor, who also actively promoted the benefits of the alliance concept. Consequently, there was a shared commitment by both companies to promoting a less aggressive and less contractual approach towards projects. Client's staff felt that the contractor adopted a more 'reasonable' stance than many other firms, for example, by being more willing to undertake out of scope work without immediately pressing for inflated compensation.

The companies had worked closely together since the late 1980s, to the point where the contractor was winning roughly 80% of the client's mechanical services work under competitive tender. The relationship between the two companies had produced enough 'trust and understanding' to enable the alliance approach to develop. As a precursor to this, a term agreement had been established for the supply of package plants. This intermediate stage was then followed by a more developed alliance approach for tonnage plants. Consequently, the alliance represented a 'formalisation' of an existing co-operative relationship and, for this project, there was no formal tendering or selection process. Client managers also valued the fact that the contractor provided the same core of key personnel when bidding for projects. This continuity was seen as important for allowing the relationship between client and contractor to be reinforced at an individual level.

5.2. Building the relationship and integrating the team

While it was relatively easy to reach agreement at senior levels about establishing an alliance in principle, it was soon recognised that developing more precise practices and procedures was more problematic. As a consequence, considerable effort had to be expended in the early stages of the project in developing shared aims and objectives and mutual understanding of each other's position.

Formal teambuilding exercises (with external facilitation) had been used to assist the process of agreeing global aims and objectives for the alliance at a senior level. The application of formal teambuilding at other levels, however, was more sporadic. Some teambuilding sessions were used, but these covered only a limited number of project participants and, importantly, did not include the internal design team. Again, there was some scepticism regarding the value of formal teambuilding and more emphasis was placed on the value of informal working relationships, especially at site level. The development of relationships on site was again helped by the use of shared offices, which permitted (and symbolised) a desire for greater openness and better communications.

Again, there was a clear recognition of the benefits of continuity of personnel within and between projects, but an acknowledgement that this was difficult to achieve in practice because of the competing requirements of

different projects. Indeed, project members from the previous (and first) alliance project had not been able to be moved to the current project because of an overlap of programmes. Lack of staff continuity was also more of a problem because of high levels of staff turnover at the client in recent months. Again, personal skills and attributes were seen as important and, although assessed quite informally (through 'gut feeling'), there had had to be some 'readjustment' of the team to create the right mix of people.

Although one expected benefit of the alliance was early contractor input into the design and into value and risk management processes, in practice this was less than anticipated. The reasons for this were lack of contractor staff availability at the time, a continuing reluctance by some of the client's engineers to accept the contractor's input and the lack of systematically developed value and risk management procedures.

5.3. Style of organisation and management

The client employed a matrix style organisation, with resources divided between functional areas and individual projects. However, this structure led to conflicts occurring between project groups in their attempts to gain resources from functional departments. This particularly affected the design process, since design engineers worked on multiple projects and were faced with conflicting priorities. The situation was exacerbated by personal appraisal procedures being orientated more towards targets set by functional managers. An earlier, simpler structure, based on project task forces, had been abandoned due to practical difficulties. However, the problem now faced was in encouraging feelings of 'ownership' of projects amongst a very fragmented design team.

At site level, the alliance approach was supposed to involve the rolling back of task duplication and create a more fully integrated client-contractor team, with responsibilities being allocated according to competencies. Although procedures were in place defining this division (included within the project-specific agreement), it was clear that a few areas of duplication still existed, particularly with regard to cost control functions (which was a reversal of what had happened on the previous alliance project). Moreover, the precise allocation of roles was open to change and negotiation and, particularly during the earlier stages of the project, there was a good deal of mutual adjustment, as managers tried to deal with the uncertainties caused by lack of clear demarcations.

5.4. Overview of the project

This case study is one in which there had been more of a 'natural evolution' of an alliance, as opposed to the 'social engineering' of more collaborative relationships (through formal contracts, incentive systems and the like). Overall, however, the alliance relationship was not gelling as people hoped it would, because of the lack of contractor input and involvement, the absence of clear-cut formal systems or procedures, the lack of commercial edge and the generally very informal approach to team development. The division of labour between client and contractor was still quite traditional, as evidenced by continuing overlap in key roles (especially cost control) and the occasional regression to traditional management styles. Moreover, the alliance continued to experience staffing problems which were exacerbated by the complexities of the internal matrix structure and a fragmented internal design team. There was also a feeling that there was a lack of global development of the alliance at the corporate level and that core messages, particularly with regard to long-term performance improvement, were not being taken seriously at higher levels or being extended properly throughout the alliance.

6. Analysis and discussion of findings

As noted earlier, both of these projects could be regarded as successful, not only in terms of conventional time, cost and quality objectives, but also in terms of more subjective criteria such as client satisfaction and judgements of savings made or claim situations avoided. Nevertheless, it was also clear that neither project ran perfectly smoothly and that some significant problems were encountered. What is therefore important to do is to examine the differences and similarities that occurred — not only because of, but also in spite of, differences in the nature of the relationship between client and contractor.

Most of the differences between the projects can be traced back to the fact that the approach taken in project B was much more structured and informed by conventional models of partnering, whereas the approach taken in project E was the result of an evolution of a long-standing relationship. Both approaches could be described as strategic, in that they were internally coherent and linked into broader business goals [16]. However, the approach on project B was clearly much more systematically developed with clear performance targets in mind. Indeed, one of the main concerns on project E was the perceived lack of commercial edge to the arrangement. Consequently, a major difference was in the relative strength of strategic ties between project objectives and broader business goals.

A second major difference was with regard to the level of sophistication of procedures. In part this reflected the fact that project B was only the start of an expected long-term relationship, whereas relationships on project

E were long established. However, it was obvious from this case that considerable lengths had been taken on project B to 'engineer' a close working relationship from the start. Thus, contractor selection procedures and team integration mechanisms were more systematically developed and applied than in project E where, in theory at least, the work of selecting the right partner and building some trust and understanding had already been done.

Perhaps more revealing about partnering in practice, however, are some of the common problems that occurred between the two projects, despite major differences in the basis of the relationship. Moreover, these problems were all a result of the interplay between the formal infrastructure of systems and procedures that supported the partnering relationship and the informal social dynamics that occurred as the projects progressed.

The first major similarity was in the problems experienced in agreeing appropriate divisions of labour between client and contractor, clarifying the roles and responsibilities of individual team members and establishing an appropriate style of management. Both project teams experienced problems due to role ambiguities and conflicts, unexpected and unplanned for duplication of effort and reversion at times to more traditional command-and-control structures. Problems caused by ambiguity in relationships are of course to be expected when forming teams for the first time and are certainly not uncommon in project environments [17]. However, what was noticeable was the difficulty experienced in translating the protocol agreed at senior levels into effective working relationships at operational levels. Whether or not the values of partnering had been properly internalised by project team members, there was clearly some degree of caution coupled with uncertainty about how these new team arrangements would work. Formal team-building exercises obviously helped ease the situation. However, it was evident too that they were not in themselves seen as sufficient to establish close, well-integrated working relationships. Ongoing experiences and actual results were the more important ways of easing the participants into a closer, co-operative working relationship. Significantly, these dynamics were just as important on project E, where continuity in the relationship at corporate level was not matched by continuity at the level of the team.

A second major similarity related to problems of being able to ensure continuity of personnel and uninhibited team selection. The result was that availability of staff became an important constraint and team formation became a process that involved some re-shuffling of team members (as well as formal team-building) to get the appropriate mix of personnel with appropriate styles of interaction. Elsewhere, it has been argued that this lack of continuity of relationships within the team, coupled with the importance attached to individual skills, poses problems for the longer term retention and transfer of knowledge and expertise with regard to collaborative ways of working [8]. With the emphasis being upon selection processes and experiential learning via team-building exercises, then the capture and codification of this 'embodied' or 'tacit' knowledge in, say, training and development programmes or procedural manuals tends to be down-played [18].

A third major similarity, was in the effects of internal structural arrangements. In both cases, the lack of a dedicated project team structure added to the ambiguities and conflicts brought about by lack of familiarity with a more flexible partnering arrangement. This is perhaps not surprising, given that matrix forms of organisation have long been shown to complicate immensely processes of interaction both within and between organisations [19,20]. What is perhaps surprising, however, is the persistent nature of such problems and the apparent continued preference for matrix-based structural solutions, despite their tendency to exacerbate rather than ease such problems.

A fourth major similarity and related problem was found in the continuing difficulties faced on both projects in managing internal interfaces with other significant groups and stakeholders within the organisation. Again, these difficulties are to be expected, given what we know of the problems caused by internal structural differentiation and the potential for conflict over resources within the firm [21]. However, what was noticeable here was the tendency for such conflicts and problems to arise in areas where a more flexible approach such as partnering is expected to have a positive impact. In particular, there were continuing problems experienced in incorporating user needs, as well as gaining contractor input into the design process. There was also evidence of fragmentation within the design team, as well as lack of integration between design and construction teams. These problems were especially apparent in project E, where, significantly, teambuilding was used somewhat selectively. However, they were also apparent in project B, where staging problems led to early 'fire-fighting' and where internal political problems threatened to lead to the project team's interests being marginalised.

7. Conclusion

The above analysis has attempted to delve deeply into the processes involved in setting up and sustaining a partnering relationship. In doing so, it has concentrated upon key social processes to explore the ways in which partnering as a process is the result of a complex interplay between formal integrative mechanisms and the ways in which those mechanisms are themselves inter-

preted and enacted [22]. The aim has been not to dismiss the role of formal mechanisms as aids to promoting partnering, but rather to counteract the very formalistic and formulaic prescriptions often found in the literature on partnering. Rather than being simply a case of applying certain tools and techniques, developing an effective partnering approach results from a complex and dynamic process in which informal processes are just as important as formal mechanisms.

There are a number of important practical implications of these research findings. First, success in achieving project objectives can mask important difficulties experienced in making the arrangement work at an operational level. In this respect, partnering is no different from any other type of project-based system. However, if the aim is to discover whether or not and how partnering delivers good performance in practice, it is obviously important to try to understand the processes involved and their specific effects upon project outcomes. Otherwise there is the danger of either over-attributing good performance (or under-attributing poor performance?) to the presence of partnering mechanisms.

Second, there is clearly no one strategy or template for successful partnering, in that it involves a variety of different mechanisms, which may or may not be very systematically developed. However, it appears unlikely that successful partnering can simply be 'engineered' by formal means or, alternatively, that it simply 'evolves' purely on the basis of informal relationships. Instead, partnering inevitably involves a combination of formal and informal processes and any attempt to develop a partnering approach needs at least to be aware of the potentially complex and dynamic interplay between them.

Third, partnering is clearly a dynamic and iterative process, the shape and character of which can change quite dramatically as circumstances unfold across the project cycle. In particular, discontinuities in personnel always ensure that there is at least some 'learning curve' and 'negotiated interaction' [17] amongst members of the project team. These complexities are added to by the fact that co-operation (as well as the factors on which it is based) can also vary significantly across different parts of the project organisation.

Fourth, one also needs to consider the relationship between the project team and wider structural-cultural attributes of the organisations concerned. For example, the problems thrown up by the matrix systems in each case, as well as the internal political context, show how internal structural or cultural attributes can enhance (or, in other instances, diminish) problems experienced in forming effective project team relationships [20]. These effects are not simply one way: indeed, it is possible to envisage circumstances in which positive or negative experiences of collaborative working with other organisations lead to dramatic changes in the wider parent organisation.

Finally, the results make clear that partnering by itself does not necessarily solve some of the problems that it is set up and designed to cope with. Problems of lack of responsiveness to user needs, lack of user and/or contractor input into the design, problems of design-construction co-ordination and the like were still widespread on these projects and formed part of the incentive to try to improve inter-firm collaboration. At best, partnering enabled such problems to be dealt with more collaboratively, efficiently and effectively. However, partnering is clearly no panacea and does not provide the means for resolving such problems at source. At the end of the day, therefore, it is important to be aware of not only the strengths but also the limitations of partnering.

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