Building 'Relationally Integrated Value Networks' (RIVANS)[1]

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Abstract

Purpose – Advocacy for the re-integration of highly differentiated, at times fragmented, construction project 'teams' and supply chains has increased in this era of network competition, yet industry targets remain illusive. This paper reports on findings of research focused on the development and validation of the building blocks for RIVANS (Relationally Integrated Value Networks) that seeks to redress this issue.

Design / methodology / approach – Complementary theoretical streams are identified through an extensive literature review, and are used to shape and inform discussions of the key RIVANS themes of value objectives, network management, learning, and maturity. Four moderated focus groups hosted in each of two workshops in Hong Kong, are used to validate these themes. Each workshop typically comprised thematic focus group sessions in between introductory presentations and a plenary consolidation session.

Findings – The findings indicate strong support for the comprehensive coverage, appropriateness and practical relevance of the key RIVANS themes. The findings also suggest that public sector clients and procuring agents need empowerment to provide adequate leadership and create the environmental contexts required in RIVANS.

Research limitations / implications – The chosen research approach and context may temper the generalisability of the findings reported in this paper. Therefore, researchers are encouraged to test the proposed RIVANS concepts in other contexts.

Practical implications – Implications for the development of basic implementation templates for RIVANS are discussed.

Originality / value – This paper responds to a clearly identified need for integrative value-based models of competitiveness in construction.

Keywords: Construction organisations, performance, relational networks, RIVANS, value, value exchange.

Article Type: Research paper

Introduction

Shortfalls in construction industry inputs and outcomes despite a decade-long programme of change (Constructing Excellence, 2006) provoke a rethinking of previous reviews and recommendations as to whether they were, for example, too optimistic, unrealistic and/or altruistic (Kumaraswamy *et al.*, 2002). One major aspect of this rethinking relates to the models or frameworks for change management. The major initiatives for change recommended in many previous industry reviews (e.g. Latham, 1994; Egan, 1998) were broadly based on supply chain management (SCM) principles and in practice mainly entailed integrated project workgroups, processes and supply chains (Holti *et al.*, 2000; NAO, 2001). These initiatives, at least initially, tended to be predominantly cost-focused, concerned mainly with the efficient management of flows – of materials, goods and information – and the elimination of waste (Dainty *et al.*, 2001). Best practice frameworks and benchmarking were advocated as the best ways of sustaining these improvement processes.

However, the ever increasing complexity of construction projects (e.g. Winter *et al.*, 2006; Aritua *et al.*, 2009), lessons from practice and findings from research suggest a need to go beyond creating and sharing collaborative practices ('best practices') to develop cooperative relationships that will use these collaborative practices as building blocks (Dyer and Singh, 1998; Campbell, 2001; Ballard and Howell, 2005; Smyth and Pryke, 2008). In order to achieve improvements on a sustainable basis, it is now increasingly recognised that business strategy must drive business processes and their supporting systems (Morris and Jamieson, 2005; Winch *et al.*, 2003) and that the tools, techniques, best practice guidelines and modalities need to be linked to theoretical foundations and

knowledge discovery in the construction management discipline (Fernie *et al.*, 2006; Winter *et al.*, 2006; Koskela, 2008). The reasons above warrant a shift in focus away from cost-focused models and networks towards more value-focused models and networks (Allee, 2008; Artto and Kujala, 2008; Barrett, 2008; Winch *et al.*, 2003).

This paper focuses on the development and deployment of "relationally integrated value networks" (hereafter, RIVANS) that are capable of aligning and re-aligning divergent values and behaviours towards a confluence of consolidated high performance levels in both project and strategic networks. The central theme of the RIVANS research programme is thus one of synergising relevant thrusts of SCM and value management, as well as empowering superior governance, exchange, procurement and delivery through value-focused and truly integrated teams. This paper addresses the above needs by exploring the major issues in developing RIVANS. The paper reports the findings of a research into the conceptual validity of the key themes in (building blocks of) RIVANS identified from an extensive literature review. It explores obstacles to improved network value creation and examines ways forward for developing implementation templates for RIVANS.

Conceptual background

Value networks in business

Value networks in business have recently attracted research in the project business research field (Winter *et al.*, 2006; Artto and Kujala, 2008; Allee, 2008); while the need to give this theme intellectual substance and coherence has been identified (e.g. Winch *et al.*, 2003; Barrett, 2008). In construction, there are mainly two types of value networks, namely, project and strategic networks. A project network is a value network made up of the

participating firms or organisations in a single project, while a strategic network is a value network of firms whose business relationships extend across many projects and are characterised by the notion of *co-opetition* – a simultaneous mixture of cooperation and competition (Artto and Kujala, 2008; Huemer *et. al.*, 2004).

Focusing on the construction industry, the RIVANS framework was developed in stages, in a Hong Kong based study. In building and visualising RIVANS concepts, Figure I was developed to illustrate a project network, indicating traditional transactional 'repulsive' forces that tend to drive members apart, while superposed transactional binding forces (in the form of fair and inclusive sharing of enhanced value achieved by relational integration) and relational bonding forces may serve to counteract and indeed integrate the project team. Figure II illustrates a strategic network of a large client with a series of longer term relationships with a few main contractors, major suppliers and other parties that go beyond traditional framework agreements. Large contractors would each have their own strategic networks too, and these may be mobilised by smaller clients on one-off projects for example.

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RIVANS adopts a developmental perspective; it recognises that all big things usually have small beginnings (cf. Ring and Van de Ven, 1994). Thus, RIVANS have been conceptualised as sets of value-focused networks, at both project and longer-term strategic levels (see Figure III), where stronger relationships empower more efficient teamworking, that in turn help to agree and achieve overall 'network value' targets.

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The RIVANS framework

The basic premise of the RIVANS framework is that a combined focus on network value indexed via the "triple bottom line" of social, economic and environmental value (or profit, people and planet) and a relational approach, while leveraging SCM and KM principles, can unleash the creativity and innovation required to achieve superior network performance on a sustainable basis. Although other more complex patterns of relationships (e.g. feedback and reciprocal relationships) can be explored, the pattern of relationships depicted in Figure III is consistent both with the extant literature and the efforts of practitioners who are attempting to improve performance through managerial interventions.

In RIVANS, the need for a network value focus is elevated to a strategic level. This implies both superordinate identification (psychological engagement with the network) and goal congruity. Goal relationships are likely to be much more pronounced at the level of the networking firms, while the effects of superordinate identification are more likely to be strong and shared at the cross-functional project work group level. Nevertheless, both have the same primary effect – that of encouraging collective action. Conflicting short-term competitive priorities and power imbalances can stand in the way of common network identity and goals. However, because the power status quo is often in a constant state of flux and the long-term goals of partners are often clearly aligned, the propriety of means is often heightened in value networks. Therefore, power would be more judiciously used to

influence network partners to reach cooperatively linked goals; although this is often not possible without managerial intervention.

In RIVANS, norms (which are enacted through network processes, routines and procedures) play a very important role. They define the boundaries for social behaviour by determine what is right, adequate, acceptable and just. Enacted network norms can on the one hand be independent of or even contravene formal procedures that emanate from the governance (procurement and contractual) strategies or on the other hand, be mere extensions or elaborations of those same procedures. In RIVANS, the governance strategies reflect as well as track the development and enactment of relational norms – norms that facilitate the development of trust and commitment. Relational norms are central to successful joint creation and equitable appropriation of value in business networks.

In RIVANS, network performance is a function of network maturity. In other words, the success of RIVANS at any point in time is a reflection of the degree of relationality of its norms and the degree of value focus. Mature, hence successful RIVANS would display robust relational norms and a high degree of value focus, while less mature ones would display a low degree of value focus and norms that are in disarray both in terms of their impact on network behaviour and the principles that underpin that behaviour. Therefore, organisational learning is implicated in RIVANS; maturity in RIVANS only comes through effective organisational learning.

The detailed explication of the conceptualisation of the RIVANS framework is outside the scope of the present paper and is the subject of a separate paper. A number of fundamental assumptions underlie studies within the lines of literature on value networks in business in

general and RIVANS in particular. These assumptions influence the basic logic and reasoning in this paper, and are summarised as follows:

- As a means of implementing project or business strategy, construction contracting necessarily requires the creation and maintenance of a *cooperative organisation*, within environmental constraints, for the mutually beneficial creation and distribution of value (e.g. Bower, 2003; Morris, 2004; Turner, 2004; Ballard and Howell, 2005; Anvuur and Kumaraswamy, 2008; Artto and Kujala, 2008). For the avoidance of doubt, this notion is related to but *not* synonymous with 'repeat trading', 'term contracts' and 'framework agreements'.

- Governance of value networks in construction depends on the interplay between three interdependent modes of organising – price, authority and trust (e.g. Eccles, 1981; Stinchcombe, 1985; Loraine, 1994; Winch, 2001). Broadly, the greater the balance shifts towards trust-based governance, the greater potential there is for mutually beneficial value creation and realisation (Hunt and Morgan, 1994; Vincent-Jones, 1994; Campbell, 2001; Ballard and Howell, 2005).

- Given the ubiquity of goal conflict (cf. Simon, 1983; Williamson, 1985; Pruitt and Carnevale, 1993), achieving congruity of and identification with network goals ('common' network goals) is a central challenge in ensuring the long-term viability of value networks and, like other aspects of organisational behaviour, involves an ongoing debate and negotiation between network members.

- The fairness of decision-making procedures, processes and outcomes and the interpersonal treatment experienced is of central importance in respect to the (bullet) points above, hence network performance in achieving value (Ring and Van de Ven, 1994; Colquitt *et al.*, 2005; Kadefors, 2005; Barrett, 2008).

Building blocks of operational RIVANS

The interactions between the assumptions outlined in the previous section are not static over the lifetime of a value network. They are continually shaped by the decisions and symbolic interactions of network partners and re-interpreted in terms of the shared values and supracontract norms that evolve to regulate collective action and which make the relationship work or breakdown (cf. Campbell, 2001).

This paper reports the findings of research that seeks to move the RIVANS concepts a step towards full implementation templates. RIVANS templates would typically include operational frameworks and supporting protocols and mechanisms, which should not only harmonise with the RIVANS concepts but also be derived from or informed by them. Network protocols and mechanisms required would typically include for network initiation and development, team building and interface management; objective setting, performance evaluation and incentivisation; and information and knowledge sharing. These would be the focus of follow-on work to that reported in this paper. The operational frameworks provide the structure for and embed the network protocols and mechanisms and would mainly be required for network value objectives identification and alignment, network management, network learning, and network maturity/performance evaluation. The scope and requirements of these operational frameworks are the focus of the present paper. The four constituent themes in (building blocks of) RIVANS were informed by an extensive literature review as summarised below and recent relevant case studies (Kumaraswamy *et al.*, 2008).

Value objectives

Value in business organisations is an illusive concept to comprehensively define and operationalise (Winch *et al*., 2003). One definition of value cited in Liu and Leung (2002:343) is the "conception of the desirable that influences the selection from available modes, means and ends of actions". Going with this definition, value has cognitive, affective and conative aspects (Liu and Leung, 2002). According to Kane (1997), the conative aspect of value has two further dimensions: *expressive* (as in value-expressive attitudes and actions) and *instrumental* (as in purposive economic/rational actions). Therefore, it is obvious that business organisations will have unique value systems. In practice, one way an organisation's values are likely to be communicated is through and understood in terms of its value objectives. Each value objective should be specific in terms of decision context, object and directionality (Keeney, 1996). Furthermore, a distinction is often made between *fundamental* objectives (strategic) and *means* (tactical) (Liu and Leung, 2002; Keeney, 1996). This value-goal specificity is needed to drive organisational commitment (Liu and Leung, 2002).

An extensive literature review suggested the following as generic organisational value objectives: public and employee wellbeing; public environmental values; image/reputation; organisational effectiveness or competitiveness; and customer satisfaction. The first two value objectives, public/employee wellbeing and public environmental values, in contrast to the remaining three which are normally associated with business organisations, have only recently gained prominence in part due to a strong wave of environmental orthodoxy and government legislation and incentives, for example, the UK Government's Command Paper on sustainable development (DEFRA, 2005). Table I shows an attempt at unpacking these value objectives. While only indicative, Table I illustrates two noteworthy points. At the

strategic network level, the first four value objectives in Table I seem aligned prima facie although the resource inputs and requirements to achieve them will differ across firms. Many project level objectives (relating mostly to customer satisfaction in Table I) are often in conflict with one another. Given the ubiquity of goal conflict even at the intra-organisational level (Simon, 1983; Pruitt and Carnevale, 1993), enough time is required for some empathic negotiation between stakeholders in order to make sense of and construct shared inclusive representations of network goals (Keeney, 1996; Male *et al.*, 2007). Alignment of stakeholder value objectives at this level will also depend crucially on the equitable distribution of rewards for value achieved and consideration for resources expended (Barrett, 2008). In this context, value management frameworks and systems (cf. Male *et al.*, 2007; Thiry, 2001) that facilitate the identification and alignment of network goals and the continual adjustment of network partners' obligations and expectations to reflect inevitable changes seem priceless (Campbell, 2001; Pollack, 2007).

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Network management in RIVANS

Network management must build on the basics of networks to promote greater integration, as well as to draw and synergise stronger value streams from all network members. Basic concepts of networks can draw on multiple sources and theoretical bases. Examples of applications to construction scenarios include: (a) Chinowsky *et al.*'s (2008) 'social network model of construction', which 'integrates classic project management concepts with social science variables to enhance the focus on knowledge sharing as the foundation

for achieving high performance teams and project results'' and provides visualisations of project networks where project managers have central roles; and (b) Fellows *et al.*'s (2007) comparison of different types of alliances – ranging from co-operatives, collaborative ventures, competitive alliances, to cartels – in the context of 'enabling team culture' and variables including autonomy, inter-organisational learning, commitment, management control, and co-ordination. Wider applications were also drawn upon in conceptualising RIVANS e.g. in: (c) network identity concept and development of boundaries at different levels for explicit acknowledgement and constructive exploitation by stakeholders as prescribed by Huemer *et al.* (2004); (d) project business networks by Artto and Kujala (2008) juxtaposed and studied interfaces between management of: a project, a project network, a business network and a project-based firm; and (e) value network approaches in modelling and measuring intangibles by Allee (2002).

Both project and strategic networks are envisaged to be driven towards value objectives and network values as discussed in the previous section in general; as well as specifically developed after value network modelling and analysis in each context, e.g. as described by Allee (2002, 2008). For example, Allee (2002) demonstrated useful approaches 'to model organisational and business relationships as living networks of tangible and intangible value exchanges' also linking scorecards and indexes; and later (Allee, 2008) provided frameworks for value creation analysis and converting intangible assets into negotiable value. In the broader context, RIVANS are expected to be targeting the triple bottom line of financial, social and environmental value in the context of their operational 'zones'.

Network learning in RIVANS

Learning organisations achieve creativity and innovation, hence competitiveness, by creating, applying and leveraging knowledge (Bresnen *et al.*, 2003; Nonaka *et al.*, 2000). Achieving this objective in RIVANS requires the full integration of knowledge management (KM) and SCM principles (Maqsood *et al.*, 2007) as well as the creation and facilitation of the contexts and environments for their effective deployment (Nonaka *et al.*, 2000). Rejecting the traditional pyramidal structure of the knowledge creation process (which juxtaposes a hierarchical ordering of data, information, knowledge and wisdom, and a corresponding explicit-tacit knowledge typology) as being too simplistic, Faucher *et al.* (2008) provide an alternative complexity view. They model the cognitive system of knowledge as the "result of the interaction between a cognitive base (data, information, knowledge, and wisdom already possessed) and its environment through its existence" (Faucher *et al.*, 2008:11). Therefore, the knowledge creation process is dynamic and each cognitive state reflects a progressive increase in the level of understanding and conversion between tacit and explicit knowledge. An explanation of how this tacit-explicit knowledge conversion occurs is provided by Nonaka *et al.*'s (2000) well-received SECI (Socialisation, Externalisation, Combination, and Internalisation) process. At the ends of these transitional knowledge states and completing the loop are 'existence' (or reality) and 'enlightenment', with the latter representing the highest possible abstraction of existence or reality (Faucher *et al.*, 2008).

While the detailed explication of this complexity view of the knowledge creation process is not within the scope of the present paper, its implications for organisational learning in value networks are. The first significant implication is the notion and importance of *pre-understanding*. Pre-understanding is the fore-structure of understanding that both precedes

and grounds any activity and interpretation. This pre-understanding can constitute an effective basis for mutual risk and performance planning between network partners (Bresnen *et al.*, 2003). It can also easily constitute 'baggage' (the prejudices and engrained stereotypes) that inhibit learning and reinforce the 'silo' mentality commonly associated with construction coalitions. These negative consequences of pre-understanding cannot be completely proscribed by targeted network partner selection methodologies.

The second significant implication, which follows on the first, is the issue of understanding the 'how-to' questions (i.e. 'know-how') in relation to managing the cognitive knowledge base as well as extracting, applying, abstracting, and generalising from one transitional knowledge state to another. Faucher *et al*. (2008) refer to these as the *metas* of knowledge. These *metas* are the focus of managerial interventions, including for example, for network socialisation (cf. Anvuur and Kumaraswamy, 2007) and the development of communities of practice (cf. Wenger *et al*., 2002). These managerial interventions must be targeted through frameworks and processes that integrate and allow up-skilling in both 'hard' and 'soft' technologies, for example, the 'K-Adv Framework' developed by Derek Walker and colleagues (Maqsood *et al*., 2007; Walker *et al*., 2005). This framework embeds KM and SCM principles within the context and logic of learning organisations and integrates three dynamically interacting components: ICT, leadership, and people. The leadership component is the focal point of their framework and encompasses the managerial interventions referred to above. The people component consists of the human and social capital dimensions and supporting processes. The ICT component facilitates and empowers the leadership and people components (Maqsood *et al*., 2007).

Network evaluation in RIVANS

This function was seen to be vital in 'building RIVANS' in desirable directions, through direct and indirect positive/negative feedback from evaluations, for example in value realisation 'rewards' in a project network, or in being by-passed when assembling the next project team from a strategic network (ideally, following a debriefing on the reasons for previous shortfalls). Secondly, this function was seen to have a range of tools to draw upon, given the growth of evaluation techniques in business and project environments in general, for example, with 'Balanced Score Card', European Foundation for Quality Management, and 'Key Performance Indicator' techniques; as well as specific 'added value' and 'network performance' measurement/assessment approaches. For example, Allee (2008) provides a value network model, with useful mechanisms and examples of value network analysis, focusing on a traditionally difficult area of converting and using intangible assets. The questions addressed resonate with those discussed at RIVANS Workshops on how to define and target non-quantifiable value elements. For example, apart from tangibles, Allee (2008: 7-11) addresses creating value from intangibles, in converting 'intangible assets such as human knowledge, internal structures, ways of working, reputation and business relationships into negotiable forms of value'.

RIVANS evaluation will link above approaches to recent examples from the ongoing UK construction industry initiative on 'integrated teamworking'. A 'maturity matrix' was developed to quantitatively test the premise that "the better integrated and the more collaboratively you work, the better the outcomes will be for the project and all those associated with it" (Davis, 2009). The results form six case studies and the key performance indicators from the Andover project that were specifically highlighted, confirm the project value that can be realised as a 'virtual company' as well as the viability of the evaluation

tools and specific indicators developed. The next stage in RIVANS will draw on such experiences, while building its own network evaluation framework and tools along the lines of the main thrusts developed in other sections of this paper. Indeed, Davis (2009) already linked the UK developments to the potential of RIVANS; and this will be followed up by tapping into relevant approaches and experiences from the UK, when developing RIVANS frameworks and mechanisms.

Validating the Conceptualised RIVANS Building Blocks

Testing and Validation Approach

The critical issues in formulating and building RIVANS discussed in the previous section were investigated for their practical relevance and import in a focus group approach. The focus group method is renowned for its versatility as a research tool, amenability to different uses and ability to yield very rich data, and is considered especially appropriate for exploring people's knowledge and experiences on a subject or theme of interest or expertise (Krueger and Casey, 2000). In order to enhance group dynamics (cf. Krueger and Casey, 2000), the compositions of the focus group panels were proposed in advance to reflect a balance in each panel between parent organisation type (client, consultant, contractor, and academia) and experience levels (e.g. director/ senior management). The issues relating to physical interaction (lack of anonymity) and group dynamics place a lot of emphasis on the quality of moderation (Krueger and Casey, 2000). Thus, a facilitator was also mobilised in advance for each focus group panel. Each focus group panel was required to address all the themes and sub-themes assigned to them both in the long-term and project specific contexts but group panellists were free to add to, delete from or de-emphasise sub-themes.

Two workshops provide the forum for the groups. They brought together a representative group of built environment professionals from industry and academia in Hong Kong and two international research collaborators. The first RIVANS workshop held on December 1, 2007 was dubbed "Enhancing performance and overall value through RIVANS", and explored the practical relevance of the RIVANS concepts, including their limits of generalizability (cf. Whetten, 1989). The second workshop, entitled "Building RIVANS", which was held on May 31, 2008, built on the outcomes of the first workshop in moving towards basic RIVANS implementation templates.

Each workshop typically involved four parallel focus group sessions in between keynote and research team presentations on the workshop and a plenary session. The keynote and research team presentations conveyed the rationale for and the core essence and coverage of the key themes in RIVANS. This was followed by brief discussions before the break-out focus group brainstorming sessions on the key RIVANS themes. Each group presented its theme-specific perspectives and conclusions in the plenary session. This was then followed by open discussions of the emergent thrusts and an overall summary by a local research collaborator. Each participant was later sent an e-summary of findings from the workshop and encouraged to communicate any new insights on the issues in an effort to keep the RIVANS discourse alive. Indeed, many of the workshop participants obliged, for example a director of a government department considering use of the RIVANS label for their flagship integrated procurement approach. Table II summarises the demographic profiles of the workshop attendees. Tables III and IV show the themes and sub-themes explored in RIVANS Workshops 1 and 2 respectively.

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The themes and sub-themes were identified for each workshop by the research team, as informed by an extensive literature review as summarised in the previous section. These themes (see Table IV) include strategic, tactical and operational issues associated with kick starting and managing RIVANS. The RIVANS workshops yielded very rich data, captured in hand written notes and digital recordings and their transcripts, which was subsequently analysed and summarised (CICID 2007; 2008). The main findings are presented in the next section. Both workshops focused on the Hong Kong context, although brief references were also made to Heathrow T5 and Scottish Parliament projects in the UK, the 2008 and 2012 Olympic Games' infrastructure projects, World Trade Organisation (WTO) and EU procurement regulations, and the Office of Fair Trading inquiry into cover pricing in the UK. However, because of the cultural complexity of the Hong Kong construction landscape (cf. Rowlinson and Walker, 1995), the findings of this study may relate well to other contexts.

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Results

The findings from the data analysis affirmed the adequacy and importance of the RIVANS concepts described in this paper, provided elaborations of the practical instruments required

to transform these concepts in to action, and identified critical issues with and limitations to their implementation in practice. There was a shared recognition among workshop participants of inherent differences in the conceptualisation and prioritisation of value among stakeholders, shaped further by factors such as power structures and the relative power distribution. However, they agreed that any conceptualisation of value must include all stakeholders, defined as those who influence or are influenced by the value and deliverables from a project. Typically, a public sector organisation's mission is seen as to 'serve the community' and a private sector organisation's, to 'survive and prosper'. These seem somewhat divergent but, when broken down, consist of clearly aligned secondary level objectives (see Table IV). However, the prioritisation and pursuit of these secondary level objectives may differ significantly among stakeholders. Managing these differences effectively was seen as an imperative for success, and requires in practical terms aligning the 'image elements' of the stakeholders' value objectives (see Table I) in each specific project. Achieving this alignment in RIVANS was seen to require a move away from conventional procurement (based on technical proposal and fee/cost) towards partner selection methodologies based on reputation for technical competence, contractual solidarity, sustainability consciousness, and commitment to long-term service relationships; and to working arrangements where network partners jointly undertake project definition, execution, and risk/reward sharing, commit to an 'open-book' accounting system and demonstrate continuous improvement through creativity and innovation.

The participants agreed that the optimal context for this kind of cooperative working would be an environment characterised by mutual respect and recognition, a 'no blame' culture, with network partners willing to engage in problem solving and to make compromises on some issues or occasions for relationship preservation in order to initiate and sustain a cycle

of reciprocity and fair-dealing and achieve win-win-win outcomes (cf., for example, Campbell, 2001; Ring and Van de Ven, 1994). This kind of context is dynamic, links the partners through space and time and yet has an element of temporal specificity to it (cf. Nonaka *et al.*, 2000). Under such conditions, issues of ownership, control, power and governance are seen to become increasingly blurred and confused, thus, requiring strong leadership and direction in order to shape and influence the motives of network partners and to cascade best practice, value for money and win-win-win attitudes through the network. The client was seen as the party best placed to provide this leadership.

Small-to-medium, one-off and on-off clients in general and public sector clients in particular were seen as requiring both knowledge and empowerment in order to effectively undertake the network leadership role. Empowerment is seen as increasing the capabilities of clients to make bold and purposive choices and to transform them into desired actions in the pursuit of value. Public sector acceptance and support were seen as key barriers to the effective management of network priorities, hence the achievement of network value objectives. These findings are generally consistent with those of previous research on supply chain integration in the UK construction industry (e.g., Briscoe *et al.*, 2004; Dainty *et al.*, 2001) although, arguably, some progress has since been made on these issues. Some of the Hong Kong specific changes also considered necessary include applying limits to multi-layer subcontracting and creating industry-supported long-term performance benchmarks. The target of incentive based network performance evaluation systems is seen by workshop participants to be overall network maturity rather than demonstrating narrow short-term benefits. This reflects a focus on benchmarking and patenting processes and routines rather than products and on facilitating open and transparent performance evaluation (with 360-degree feedback) and against objectives and benchmarks

appropriately categorised into short-, medium- and long-term to reflect the needs over a timeline.

Discussion

There has not been scope and space to include all participant contributions and yet provide findings that are true to the full nature of the data. The findings reported in this paper reflect the core essence of and commonalities in the workshop data. Consequently, a minority of views (some of which were quite provocative and directed at fellow focus group panellists) are not reflected in the findings. Some of the focus group report summaries and presentations appeared to be based on the views of the group that compiled or presented them rather than the evidence of the complete record (both hand written notes and voice recordings) of the focus group deliberations. Clearly, this raises questions about the verification of data in such focus group sessions. The data is also location-specific although some of the issues discussed, the cultural complexity of the Hong Kong construction landscape and the input of the international research collaborators may mean that many of the research findings may relate well to other contexts. These limitations place the findings of this paper in proper perspective – as part of an ongoing process of validation of the building blocks of RIVANS in construction.

More work needs to be done in linking project and strategic needs to conceptual frameworks and directions in the infrastructure construction field. For example, specific 'value for money' outcomes sought in road infrastructure delivery as defined by Jensen and Fernando (2006) in Queensland, Australia will need to be mapped into the broader value

analysis frameworks that will draw on those of Allee (2002; 2008) and others, while following the main thrusts emerging from the RIVANS workshop findings.

Yet, the most critical challenge to RIVANS relates perhaps to ascertaining how its basic tenets respond to and are influenced by the current recession. The tendency in previous recessions has been for construction organisations to restructure in ways that saw them cut back on or entirely freeze investments in and for the future, focus on core business and adopt strict transactional governance regimes (cf. Hillebrandt *et al.*, 1995; also see Green *et al.*, 2005). Investments in RIVANS typically demand a long-term perspective. With many construction organisations already in dire straits or wiped out as a result of the recession, the question remains whether or not the present recession will evoke responses similar to those of previous recessions. Arguably, construction organisations that invest in or maintain membership of value networks during this recession must have the long term in sight – that of creating competitive advantage and building market share compared to the competition in the emergent post-recession market. Indeed, the CIOB's *Skills in the Construction Industry* (2009) report recommends that employers look to the long-term rather than reacting to short-term events and focus on retaining and up-skilling in the core competences necessary to thrive in the post-recession market. However, the jury is still out on the full effects of the recession, and the RIVANS concepts have yet to be tested for their robustness to these effects.

Conclusions

With the focus of competition in the market for construction changing from between individual firms to between networks of firms, RIVANS are conceptualised as being a

viable strategy for sustained competitive advantage. RIVANS focus on developing cooperative relationships in the pursuit of overall value. They create the right context for organisational learning, leveraging KM and SCM principles and practices as building blocks. Four major constituent themes towards RIVANS implementation templates (value objectives, network management, learning, and evaluation) developed and validated using focus group panellists drawn from a representative cohort of built environment professionals in two workshops, found strong support for their practical relevance and appropriateness. The next distinctive stage of the RIVANS research programme would be the development of network protocols and mechanisms, including possibly framework testing/confirmation in a third and final workshop. Frameworks that build in and on the RIVANS concepts discussed in this paper would ensure the seamless integration of collaborating partners to produce and leverage creativity, innovation and value across the entire network.

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Tables

Table I: Indicative breakdown of generic value objectives

Value Objectives			
How →			*← Why*
Public service recognition; Corporate image	▪ Corporate citizenship ▪ Good governance ▪ …	▪ Transparency, probity and accountability ▪ Diversity and inclusion ▪ Legacy ▪ Organisational commitment ▪ Superior ethical standard ▪ …	▪ Good communication channels ▪ Maximise public and employee participation ▪ Charitable acts or contributions
Public environmental values	▪ Minimise adverse environmental impacts ▪ …	▪ Environmental stewardship ▪ Regulatory compliance ▪ …	▪ Going the 'extra mile'
Promote public and employee wellbeing	▪ Minimise detrimental health and safety impacts ▪ Enhance quality of project experience ▪ …	▪ Security of personnel and facilities ▪ Operations and maintenance safety and health ▪ Construction safety and health ▪ Safe and inclusive environment for workforce and public ▪ …	▪ Regulatory compliance ▪ Public/employee attitudes and values ▪ Risk and uncertainty perception, communication and containment ▪ Openness and honesty
Organisational effectiveness; competitiveness	▪ Commercial success ▪ (Re)positioning for the future ▪ Enhance reputations ▪ Organisational learning ▪ …	▪ Creating and/or extending market share ▪ Creativity and innovation ▪ Enhanced business opportunities ▪ …	▪ Trust and cooperation ▪ Helpful and friendly ▪ Empathic listening and negotiations
Satisfy customer (requirements)	▪ Value for money ▪ Improve partners' financial performance ▪ Participant satisfaction ▪ …	▪ Capital, maintenance and operating cost efficiencies ▪ Schedule optimization ▪ Meet or exceed functional, technical and safety performance criteria ▪ Project/service quality ▪ Quality of project experience ▪ Profit, return on investment, overheads recovery ▪ …	▪ …

Table II: Demographic profiles of workshop attendees

RIVANS	Total attendance	Attendance Breakdown			
		Academia	Client	Contractor	Consultant
Workshop 1	35	5 Professors; 4 Assistant/Associate Professors; 6 MPhil/PhD researchers	2 Directors; 3 Project/Contracts Managers; 1 Commercial Manager; 1 Design Coordinator	3 Directors; 2 Project/Contracts Managers	7 Directors; 1 Barrister
Workshop 2	41	6 Professors; 5 Assistant/Associate Professors; 8 MPhil/PhD researchers	3 Directors; 1 Asst. Director; 4 Project/Contracts Managers; 1 Planning Manager	3 Directors; 1 General Manager; 2 Project Directors; 1 Project Manager	4 Directors; 1 Partner; 1 Barrister

Table III: RIVANS Workshop 1 themes and sub-themes

Themes	Sub-themes
1. Defining & Pursuing Value in RIVANS	a. Defining stakeholder value b. Identifying all stakeholder important value dimensions c. Developing potential 'network value' (overall common value) dimensions d. Identifying criteria and indicators for measuring stakeholder and network value e. Mechanisms to optimize network value f. …
2. Defining System Structures for RIVANS	a. Contractual systems & mechanisms b. Network steering mechanisms c. Resource sharing systems & mechanisms d. …
3. Selecting & Sustaining RIVANS	a. Identifying & evaluating potential partners b. Assembling project 'teams' c. Encouraging competitiveness (both intra-network & inter-network efficiencies) d. 'Critical Success Factors' & 'Common Barriers' e. …
4. Motivating RIVANS	a. Incentive mechanisms b. Facilitating & feedback processes c. Continuous improvement mechanisms d. 'Critical Success Factors' & 'Common Barriers' e. …

Table IV: RIVANS Workshop 2 themes and sub-themes

| Themes	Sub-themes
1. Value Objectives (Network Values)	a. Public and Employee well-being b. Environmental Stewardship c. Image; Reputation; (Corporate Image; Public Service Recognition) d. Effectiveness; Competitiveness; (Business/Commercial success/viability; Efficiency) e. Customer Satisfaction (Explicit Client requirements; End-User needs) f. …
2. Network Management (in RIVANS)	a. Network Size (optimising Layers, numbers in each Layer/ Group, Reach/ Spread …) b. Selecting new Network partners (based on past & potential performance; and past & potential relationships) c. Designing & assembling specific Project Teams (based on complementary core competencies; past performance & relationships) d. Problem Solving & Dispute Resolution e. Network Steering (sustaining & improving network structures & operations) f. Interfacing with Non-network partners and projects g. …
3. Network Learning (in RIVANS)	a. Knowledge Management (capture, sharing, use, development …) b. Creativity & Innovation c. Up-skilling (in hard & soft technologies) d. Human Capital (Core Competencies: e.g. cognitive, job knowledge, task proficiency, interpersonal skills, emotional intelligence, self-regulation, self-facilitation …) e. Social Capital (Teamworking, Social relations: e.g. in groups, networks; trust, collective action & solidarity, culture, social inclusion, information & communication)
4. Network Evaluation (in RIVANS)	a. Evaluating Partners (on core competencies, performance, relationships ...) b. Performance evaluation set-up (transactional building block – projects, relational building block – firms); and evaluation and aggregation tools c. Benchmarks, Criteria, Indicators and Measurement Tools d. Feed back mechanisms – e.g. incentive structures, penalizing opportunism … e. …

Figures
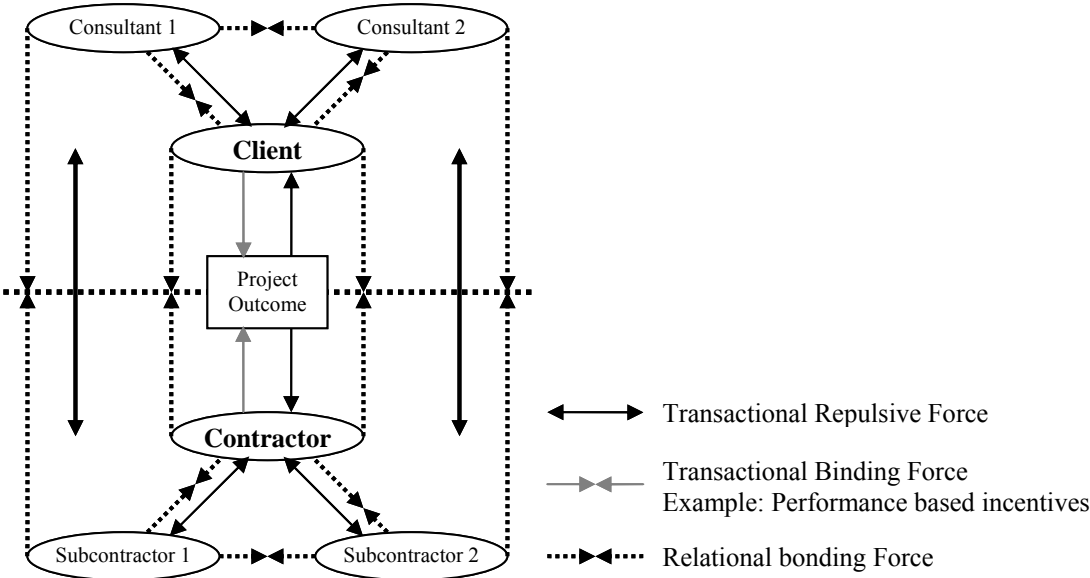
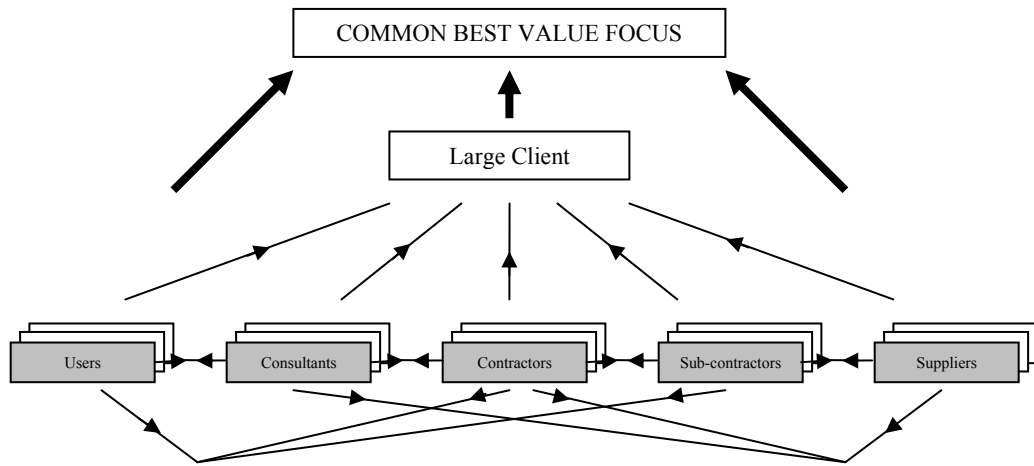**Figure I: Transactional and Relational Forces in a Project Network**

Figure II: Strategic Network of a Large Client

PURPOSE OF
SOCIAL   MEANING   NETWORK
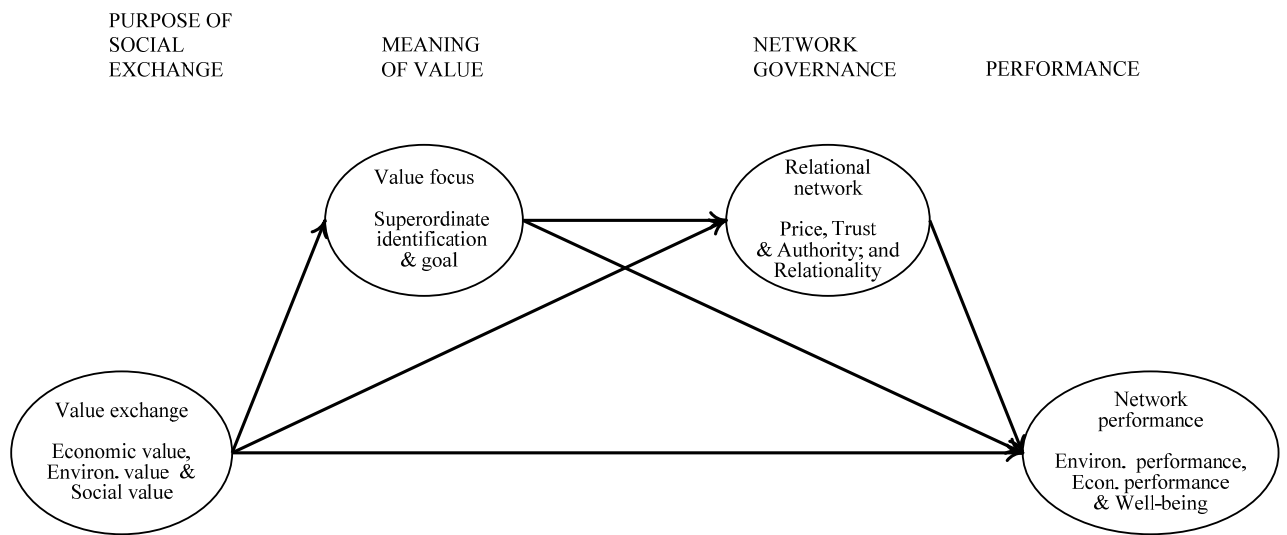EXCHANGE   OF VALUE   GOVERNANCE   PERFORMANCE

Figure III: The RIVANS Framework