



Supply chain sustainability: a relationship management approach

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Abstract

Purpose – The purpose of this paper is to examine, by means of case studies, the mechanisms by which relationships can be managed and by which communication and cooperation can be enhanced in sustainable supply chains. The research was predicated on the contention that the development of a sustainable supply chain depends, in part, on the transfer of knowledge and capabilities from the larger players in the supply chain.

Design/methodology/approach – The research adopted a triangulated approach in which quantitative data were collected by questionnaire, interviews were conducted to explore and enrich the quantitative data and case studies were undertaken in order to illustrate and validate the findings. Handy's view of organisational culture, Allen and Meyer's concepts of organisational commitment and Van de Ven and Ferry's measures of organisational structuring have been combined into a model to test and explain how collaborative mechanisms can affect supply chain sustainability.

Findings – It has been shown that the degree of match and mismatch between organisational culture and structure has an impact on staff's commitment level. A sustainable supply chain depends on convergence – that is the match between organisational structuring, organisation culture and organisation commitment.

Research limitations/implications – The study is a proof of concept and three case studies have been used to illustrate the nature of the model developed. Further testing and refinement of the model in practice should be the next step in this research.

Practical implications – The concept of relationship management needs to filter down to all levels in the supply chain if participants are to retain commitment and buy-in to the relationship. A sustainable supply chain requires proactive relationship management and the development of an appropriate organisational culture, and trust. By legitimising individuals' expectations of the type of culture which is appropriate to their company and empowering employees to address mismatches that may occur, a situation can be created whereby the collaborating organisations develop their competences symbiotically and so facilitate a sustainable supply chain.

Originality/value – The culture/commitment/structure model developed from three separate strands of management thought has proved to be a powerful tool for analysing collaboration in supply chains and explaining how and why some supply chains are sustainable, and others are not.

Keywords Supply chain management, Organizational culture, Organizational structures

Paper type Research paper



Introduction

The importance of management of the supply chain has been a topic of importance and debate for many years. However, in order to effectively manage the supply chain and for the supply chain to be sustainable, it is necessary, in the construction industry, to overcome the intensely ingrained adversarial attitudes which predominate within the industry. As a consequence, we examined, by means of case studies, the mechanisms by which relationships can be managed and by which communication and cooperation can be enhanced. The underlying principle in this approach is to ensure that, through collaboration and open communication and joint problem solving, the supply chain develops into a sustainable system in economic, social, environmental and safety and health aspects.

Current situation

In order to set the scene, we must first address the context in which we are operating. When considering the market in which a firm operates, it is essential to understand that markets vary in their competitiveness from time to time, from location to location and technology to technology. Hence, how information is diffused across a market will also vary and certain players, generally the larger players, will have an information “advantage”. Thus, the development of a sustainable supply chain depends, in part, on the transfer of knowledge and capabilities from these larger players down the chain. Of course, the environment and the inputs and outputs between environments and firm help to shape strategy and thus competitive advantage. However, acting, so to speak, in the opposite direction is a resource-based view of strategy which examines the characteristics of a firm and how these lead to competitive advantage (Barney, 2001). In this instance, we draw a parallel between sustainability and competitive advantage. For further discussion of this, see Walker and Rowlinson (2007).

A resource-based view of organisational strategy accepts that factors of production are elastic in supply. However, some resources and organisational capabilities are inelastic. For example, certain capabilities can only be developed over long periods of time and firms have to understand the pathway along which these capabilities can be developed over the short and medium term in order to develop and take advantage of these. Of course, certain resources cannot be bought and sold. The role of the client organisation assisting the development of the subcontractor and so enabling a sustainable supply chain is thus evident.

In order for a firm to maintain its competitiveness and sustainability, it must also have the capability to learn and the ability to change in order to remain sustainable. Thus, what is important for an organisation is strategic fit. This is the essence of organisational adaptation (Zajac *et al.*, 2000) and essentially stems from the view that environment and strategy are a dynamic process of co-alignments which, when successfully managed, results in a fit between strategy and environmental context and thus leads to high performance and sustainability (Venkataram and Prescott, 1990; Tuuli and Rowlinson, 2009a, b).

A resource-based view of a firm is basically a contingency view: each firm's capabilities evolve along a particular path which is determined in part by the firm's history. Hence, it is expected that as a means of developing competitive advantage, and so a sustainable supply chain, firms must evolve in terms of their resource base (Hoopes *et al.*, 2003). In order to develop capabilities, a range of resources, including

intangible resources, need to be harnessed. These intangibles include skills, knowledge, relationships, culture, reputation and competence.

If a firm is to maintain a competitive advantage and its sustainability, it needs to develop core competences which are capable of being developed further over time in response to both environments and internal resources. When considering institutional economics, transaction costs, it is taken as a given that organisational development is best suited to institutional arrangements that minimise the cost of collaboration and assimilation as a means to development (Williamson, 1990). Hence, approaches such as relationship management, which fall outside of the remit of contract, are well suited to such development and we investigate later in this paper how nuances in procurement methods and the differing internal workings of firms can enhance or retard the development a sustainable supply chain. At the same time, a sound strategy is essential; strategy and organisation need to coalesce to ensure success.

Many studies have been carried out in relation to construction procurement methods (Adekunle *et al.*, 2009). Evidence shows that there needs to be a change of culture and attitude in the construction industry, moving away from traditional adversarial relationships towards cooperative and collaborative relationships. At the same time, there is also increasing concern and discussion on alternative procurement methods, involving a movement away from traditional procurement systems. Relational contracting approaches, such as relationship management, are business strategies whereby client, commercial participants' and stakeholders' objectives are aligned. This paper reviews a range of relationship management project case studies undertaken between public and private organisations in Queensland, Australia and reports on the critical factors identified that influence the success of relationship management projects and, so, supply chain sustainability. Furthermore, three case studies are presented which illustrate:

- (1) the case in the Australian construction industry;
- (2) a case, based on technology as a driver, based in Australia; and
- (3) an out-of-country case, The Netherlands, which illustrates similar principles but within a different cultural context.

Together, these give validity to the findings whilst highlighting differences across sectors and cultures.

The problem

Relationship management is a system that provides a collaborative environment and a framework for all participants to adapt their behaviour to project (and longer term) objectives. It is about open communication, sharing resources and experiences, exposing the "hidden" risks in the project. The case studies suggest that leadership has a strong influence on the relationship management climate which needs to be facilitated and nurtured. Commitment and action by senior management (and, so, parent organisations) can have a strong impact on the team and relationship management culture, indicating relationship management has a high chance of failure when there is inadequate support from top management. Like all relational contracting approaches, trust between relationship management partners is important. The authors conclude that without a positive approach to relationship management a sustainable industry and continuous improvement are not possible. So, the authors

postulate that a “sustainable supply chain” is essentially tautological without the existence of a clear relational vision that leads to both soft and hard infrastructure to assist and inform decision making and encourage relationship building.

Relationship management principles

In both mainstream and construction management literature, there has been a steady rise in the number of papers reporting studies on the implicit link between organisational culture and performance (Handy, 1985; Wood and Ellis, 2005). Benefits of partnering such as win-win relationships, time and cost savings, trust, motivation and open communication are highlighted in a stream of literature (Bennett and Jayes, 1998; Bresnen and Marshall, 2000; Wood *et al.*, 2002; Wood and Ellis, 2005).

Numerous reports published in the past decade, such as the Tang's (2001) report on *Construct for Excellence: Report of the Construction Industry Review Committee*, the Hong Kong Housing Authority (2000) report on *Quality Housing: Partnering for Change, Building for Growth* by Australia NatBACC and the Egan (1998) report on *Rethinking Construction*, all indicate the way forward for the construction industry. These reports advocate a move away from adversarial relationships and towards the use of relational contracting approaches. However, such approaches require a culture change.

More recently, the NAO (2001) report on *Modernising Construction* and Sir Egan's (2002) report on *Accelerating Change*, both highlight the construction industry need for better management of construction supply chains and more engagement with the supply chains to achieve sustainable construction. Relationship management is a sustainable approach to the industry in terms of social, environmental and economic sustainability and can provide a positive contribution to sustainability and help to satisfy client and stakeholder interests (Blau, 1963; Darwin, 1994; Darwin *et al.*, 2000; Macneil, 1978, 1985; Rousseau and Parks, 1993). It provides the means to achieve sustainable, on-going relationships in long and complex contracts by an adjustment process of a more thoroughly transaction specific, ongoing, administrative kind (Anvuur and Kumaraswamy, 2007, 2008; Kumaraswamy and Matthews, 2000). Although the potential benefits of relational approaches (for example, construction partnering, alliancing, PPP and relationship management) have received strong interest in the construction industry, relational approaches are not yet the dominant choice of procurement strategy (Phua, 2006).

Bresnen (2007) points out studies in partnering often distil partnering into a set of principles such as *The Seven Pillars of Partnering* (Bennett and Jayes, 1998). Many reports also define similar foundations for a more collaborative approach to projects between clients and contractors. However, the benefits and limitations of partnering are often disregarded (Bresnen, 2007; Green, 1999). Green (1999) argues that the philosophy of continuous, measured improvement from the definition of partnering presented by Construction Industry Board (1997) actually demands that each project exceeds the performance of the previous one rather than ongoing sustainability of the industry as a whole. This is essentially a corporate social responsibility issue. Emphasis is put on the search for general principles and universally applicable tools and techniques that can be used to support partnering (Bresnen, 2007). Partnering is adopted as a set of procedures and examples of “good practice” which is heavily based on the number of successful cases, rather than a process change or an attitude change.

Recent research funded by the Cooperative Research Centre for Construction Innovation explores relationship management in a particular economic, environmental and social context in Queensland, Australia. According to Rowlinson and Cheung (2005), the key to the relationship management process is understanding of team and organisational culture. It is necessary to fit a contract strategy to the collaborative approach that relationship management brings. They also point out one should not solely rely on the partnering or facilitation workshops (Alderman and Ivory, 2007; Cox and Ireland, 2002; Rowlinson, 2001; Winch *et al.*, 1997; Winch, 2010), a formal structure must also be laid out (Rowlinson, 2001; Winch *et al.*, 1997; Winch, 2010). Relationship management is about changing attitudes and is both an organisational and an industry-level issue, which requires an industry wide education and training initiative.

Relational contracting is about moving away from adversarial relationships, in order to develop a team, and, in this instance, a long-term commercial relationship. Relational contracting approaches, such as partnering, alliancing and relationship management, are about communication, cooperation, trust, culture, mutual objectives and risk sharing (Bennett and Jayes, 1995; European Construction Institute, 1997; General Contractors of America Associated, 1991; Liu and Fellows, 2001; Matthews, 1999; Sanders and Moore, 1992; Lau and Rowlinson, 2009).

According to Rowlinson and Cheung (2002), relationship contracting (referred to as relational contracting above) is based on a recognition of and striving for mutual benefits and win-win scenarios through more cooperative relationships between the parties. Relationship contracting embraces and underpins various approaches, such as partnering, alliancing, joint venturing, and other collaborative working arrangements and equitable risk sharing mechanisms. Relationship contracts are usually long term, develop and change over time, and involve substantial relations between the parties and the development of trust.

Context

This paper aims to shed some light on the practices and pre-requisites for relationship management to be successful and so for supply chain sustainability to develop. The problem addressed in the case studies is the implementation of relationship management through a range of projects between public and private sector organisations in Queensland, Australia. The rationale behind this research is that the implementation of relational contracting approaches requires a change of mindset, a culture change, and all client, contractor, subcontractors and suppliers must change; with greater interaction in the project delivery strategy, organisation culture, commitment and structure. When applied to the supply chain, this approach has the potential to develop firm competences and hence lead to sustainability.

Rationale

A number of recent studies address innovation and change in the context of inter-organisational collaboration in project-based settings (Alderman and Ivory, 2007; Cox and Ireland, 2002; Rowlinson, 2001; Winch *et al.*, 1997; Winch, 2010). Organisational structure, organisation culture and organisation commitment are identified in these works as being significant in shaping organisational performance, and so form the main parameters of this discussion. The objective of this research is to investigate the impact of the various cultural variables on project performance, which

then allows patterns and characteristics leading to successful collaboration amongst firms to be defined. In order to do this, we used independently collected data so verifying the thinking of key individuals in the organisations as to the strengths and weaknesses of the systems currently in place. This paper reports the findings captured from research undertaken with a public organisation focusing on supply chain relationships.

Objectives

The objectives of this research investigation were three-fold. The underlying objective was to investigate the impact of moving relational contracting down the value chain and so empowering and developing a sustainable supply chain. In order to do this, the researchers had to conduct an audit of the current state of relationships between the client, in the first instance Queensland Government Department of Transport and Main Roads (DTMR), and its suppliers and subcontractors. Having conducted the survey of the structure and extant relationships, the researchers then went on to attempt to identify the skills sets required for both encouraging and maintaining positive relationships and open communication and investigating how well adapted both parties were to maintaining and continuing this relationship. However, it was apparent, as argued in the introduction, that other factors, such as the economic, political and social situation intervened to moderate the relationship and so the sustainability of the supply chain in all cases (later, an out of sector company and an out of country contractor are presented as case studies to provide cultural and contextual contrasts in order to validate the findings). The final focus of the research was to implement changes within the network of contracts with the stakeholders and clients in order to develop and maintain a sustainable industry.

Relationship management framework

The study of how relationship management can be engendered in an organisation is bounded by the context of the organisations, products and industry. Thus, it is necessary to address the dimensions and factors which will affect an organisation and its ability to develop sustainable relationships through a positive relationship management approach. It has been postulated that the dimensions of organisation culture, organisational structuring and organisation commitment form the matrix within which relationship management is developed. Admittedly, the technologies employed in the supply chain will also affect the way in which relationships are formed and broken. In order then to put these ideas in context, a brief review of the dimensions is included below.

Types of organisational culture. Handy (1985) postulated that a task culture is preferred by professionals. Handy describes task culture as very much a small team approach. It is best suited to groups, project teams or task forces which are formed for a specific purpose, such as delivering a project; individuals in the organisation belong to his/her group for each project. Task culture can be found where the market is competitive, the product life is short and speed of reaction is important. Individuals are empowered with discretion and control over their work. In this instance, task culture fits well with the organisation as the participants generally work as a team, i.e. a project team. Individuals form a team for a specific purpose, and cooperate with smaller organisations, e.g. pre-cast concrete suppliers, contractors to deliver projects.

Also, achievement is judged by results, in this instance success of the project which includes the delivery and quality of particular products, e.g. concrete.

On the other hand, power culture is often found where economies of scale are more important than flexibility or where technical expertise and depth of specialisation are more important than project innovation or product cost. In this case, it is apparent in a highly structured, stable company, a bureaucracy. Procedures, role descriptions and formal authority are the mechanisms by which work is undertaken. Coordination is from the top, and the product has a long life, i.e. the organisation still exists when projects (e.g. highway upgrade, road and bridge building) have been finished. Professionals in the organisation would not expect to be abandoned after the completion of each project. On the other hand, a power culture is frequently found in small entrepreneurial organisations. Power and influence derives from the top person/group. The organisation depends on trust and empathy for its effectiveness, and with a personal relationship, the individual matters more than any formal title or position. This culture is apparent in power-orientated forms and is politically minded – decisions made are hindered by politicians. It is risk taking – sharing risks with contractors and open communication, reflecting principles of relationship management. Maximum independence is given to heads of units – principals have great control over his/her teams and projects. Hence, the existing organisation structuring, necessary for a large public sector organisation to work effectively, is fundamentally at odds with the needs of temporary intra-organisations, i.e. project organisations. The mismatch identified here can be seen to have an effect on issues such as commitment and structuring. This paradox between organisation and employee satisfaction is not new but is one that must be recognised and addressed.

Levels of commitment

Organisational commitment has been conceptualised by Allen and Meyer (1990) into three dimensions – affective, continuance and normative commitment. In the DTMR case study, the degrees of emotional attachment to the organisation, affective commitment, and acceptance of organisation's values, normative commitment, were found to be strong; whereas, the degree of continuance commitment (the cost of leaving the organisation outweighs the cost of staying) was found to be more "middling". In Rowlinson's (2001) Hong Kong study with a public sector organisation, the levels of normative and affective commitment were found to be relatively low. On the other hand, he reported a high degree of continuance commitment level amongst the Hong Kong professionals. Rowlinson suggests the mismatch between organisational culture and structure, professionals' expectation and procedures might affect issues such as commitment, as shown in his case study with the Hong Kong public sector organisation. A relational contracting approach can only succeed if the collaborating organisations accept its ethos. Hence, sharing values and being committed to the goals and objectives of the organisation is crucial in client, contractor and supply chain integration.

Organisational structure. Van de Ven and Ferry's (1980) organisational assessment explores organisational structuring. Its aim is to assess organisation performance in relation to how contracting parties are organised and to the environment in which they operate. Using the results generated from a survey and interviews, it appeared that although the client organisation was initially expected to follow the logic of developmental group mode, the logic of a cross between systematised impersonal mode

and discretionary personal mode was more closely followed. This reflects the results derived from Handy's studies. Professionals should be, and wish to, follow a developmental group mode and do prefer working in a task culture but are actually in a mix between role/power cultures and follow the systematic/discretionary mode (Table I). In subsequent interviews with survey respondents, senior management was often described as a power centre, where information and decisions were diffused from the top.

Methodology

The research methodology used is a triangulated approach based on Cheung's (2006) earlier research where questionnaire survey, interviews and case studies were conducted. A face-to-face questionnaire survey was carried out with 100 professionals from 27 contracting organisations in Queensland from June 2008 to January 2009. A follow-up survey sub-questionnaire which examined project participants' perspectives was sent to another group of professionals (as identified in the main questionnaire survey). Of 486 sub-questionnaires distributed, 116 completed and usable ones were returned, yielding a response rate of 24 per cent. Statistical analysis including multiple regression, correlation, principle factor analysis and analysis of variance were used to identify the underlying dimensions and test the relationships among variables. The case studies below illustrate the main findings of the study in respect of relationship management of a sustainable supply chain.

Case study 1 – the pre-cast concrete industry and DTMR

DTMR has had long relationships with its supply chain, and has developed a mutual understanding of organisation policies and direction in general; perhaps, suggesting a reason for both parties finding their working relationship to be relatively effective. DTMR and its supply chain both believe the other party is quite familiar with each other's services and goals and both parties find their degree of personal acquaintance

	Systematised impersonal mode	Discretionary personal mode	Developmental group mode
Difficulty and variability of tasks, problems, issues encountered by subsystem			High
<i>Salient dimensions of managerial subsystem</i>			
1. Organisational referent		Hierarchy	
2. Coordination and control by	Rules, plans	and staff	
3. Resource and information flows among organisational levels, units and positions	and schedules		
a. Direction	Diffuse		
b. Amount		Medium	
c. Standardization and codification		Medium	
4. Perceived interdependence among components			High
5. Frequency of conflict among components	Low	Medium	

Table I.
Hypothesised patterns of
DTMR design mode

to be good, suggesting a level of trust is developed over a series of interpersonal encounters and established mutual obligations (Moorman *et al.*, 1993; Lau and Rowlinson, 2009). Trust is an underpinning component for relationship management (Cheung *et al.*, 2005).

In this study, the supply chain included the main contractor, suppliers and other government agencies/divisions. The type of contractual arrangements between the client and each of the members of the supply chain was different. The client and main contractor, who had an ongoing series of contract, had a direct contractual relationship, ranging from hard-dollar with relationship management contracts to alliance agreements. In this case, it was the former. The client and suppliers had no direct contractual relationship nor did the client and other government agencies/divisions.

The average degree of conflict for both parties is found to be low. Interviewees pointed out the majority of conflicts/disagreements are on technical and programme issues. The supply chain indicated a medium-high level of agreement with DTMR, whereas DTMR indicated a medium-low level of agreement with its supply chain. A point of interest is that most survey participants from DTMR indicated they do not know the ways of work/services provided by other parties. An interviewee mentioned:

[. . .] the contractor/supplier worry that knowledge or their trade secrets might be stolen by us (inspectors, visitors). However, labour moves to different sites and would give suggestions [. . .] this is a small industry [. . .] so, we are not a real threat to them.

The fear of knowledge disclosure and the lack of trust in the supply chain are expounded in the example. Relationship management is about opening up communication and working towards aligned goals to overcome such views.

The most frequent use of communication methods by the professionals are telephone calls and written forms, followed by face-to-face conversations. Survey findings show that the higher the frequency of written communication, the more effective the working relationship is. Also, although there is a high frequency of contact between both parties, the amount of time they spend with each other is relatively low. A point to note is communication in writing is not limited to written reports or letters, but also e-mails. This was confirmed by the follow-up interviews, due to the resource constraints and distance between parties, physical meetings were not always viable and a large amount of information exchange is conducted by phone and confirmed by e-mail. The quality of communication is found to be satisfactory (based on the degree of difficulty of getting in touch and getting ideas across to the other party). Should the degree of difficulty of getting in touch and getting ideas across to other parties deteriorate, the performance of the public sector organisation is hindered and vice versa. This is purely a consequence of the nature of construction in that all levels in the value chain are interrelated – from policy makers to principal engineers (implementing policy in specifications) to structural engineers (ensuring works are carried out according to specifications) to concrete suppliers (supplying products according to specifications).

A high level of commitment is found between DTMR and its supply chain. Survey findings also indicate both parties found their relationship very productive. Both parties believed the time and effort spent have been worthwhile and were very satisfied with the relationship. Strong positive correlations are also found between the extent of commitment by both parties, the degree of productive relationship and the relationship satisfaction level, suggesting these issues are interrelated. High

commitment from both parties results in a more productive relationship. Senior management commitment is crucial in pushing changes forward – from revising contract conditions, with a stronger focus on other important factors than best price when determining best value, to implementing specification changes in Standards Australia. Lack of top management commitment, poor understanding of the relationship management concept, inappropriate organisation structure and low commitment from partners lead to supply chain relationship failure (Akintoye *et al.*, 2000). The concept of relationship management must be understood by all parties – client, contractor and supply chain. Parties must recognise the benefits of relationship management and understand the approach; this requires education and training with intervention of a facilitator in order to ensure relationship management effectiveness (Cheung *et al.*, 2005).

Positive correlations are found with the level of personal acquaintance and the extent of productive and satisfactory relationship, implying the better both parties know each other on a personal basis, the more productive and satisfactory is the relationship. Strong significant correlations are also found between personal acquaintance, consensus and awareness. Various interviewees pointed out personal relationships are very important for the project and negotiations. Parties become more cooperative, issues are raised at the first instance (e.g. at design stage), and there is sharing of information, including design issues between clients and suppliers, and technical issues across states, which led to reduction of risks and minimisation of errors. Innovative ideas and collaborative working relationships are developed between the parties. The observation was reflected by the positive correlation between consensus and resource dependence. There was a cultural shift from adversarial to proactive, trusting relationships between DTMR and its supply chains. The positive correlation between personal acquaintance and resource flow between both parties indicates the better one knows the other, the more transactions (e.g. money, work) there are.

Although both parties indicated there are high levels of commitment and satisfactory relationships, findings show the equality of transactions between the parties is only average or below, suggesting the equality of the give-and-take relationship with these was unbalanced. Relationship management is about striking a balance between the partners, in this case clients and suppliers, to achieve a long-term relationship. By establishing a long-term relationship with suppliers, the public sector organisation can assist the suppliers to create value and material development, e.g. quick-setting concrete. With common goals and objectives in mind, under a relationship management regime, clients and suppliers can potentially make savings in their operations through sharing and exchanging technical and managerial knowledge of the project.

Resource dependence was found to have a positive correlation with frequency of communication as expected. Constant communication at all levels is needed for the exchange of knowledge, such as DTMR's expertise and suppliers' technical and practical knowledge. A strong correlation was also found between frequency of communication and the level of awareness. Also, it is shown that the higher level of awareness of the other party, the higher degree of consensus. However, lack of (urgency) awareness and poor attitude towards issues are comments which constantly surfaced at interviews. Such behaviour often leads to frustrations or recurring problems and an inability to close issues.

Case study 2 – My VirtualHome™ (1963)

This section briefly introduces a “hard” technology which can assist in the development of relationships and so lead to provide a route to a sustainable supply chain. This study was undertaken through the collaboration of the authors and in-house researchers. The previous sections have discussed the soft infrastructure of relationship management but the hard infrastructure is also important in facilitating relationship building in the supply chain. The concept of My VirtualHome™ is to provide a better and interactive communication platform between customers, suppliers (product and service), trades people and consultants. It provides an information and communication technology (ICT) platform for customers to select products from the database and provide an instant preview (3D models and “walk throughs”) of a range of designs and looks of the final product. At the same time, it provides interactive communication channels between business/business, business/customer and customer/customer. Suppliers can deliver information directly to customers via 3D catalogues on My VirtualHome™, which enables customers to browse through and purchase from the suppliers. Customers are made aware of the availability and a virtual view of resources at the design stage, before committing to set designs and products in monetary terms. At the same time, My VirtualHome™ acts as a knowledge-sharing platform, where product details are shared (3D categories) and completed home/room designs can be uploaded to the web site for download and sharing amongst users. For this multi-dimensional communication tool to be sustainable, it requires an ongoing partnership between suppliers, manufacturers, consultants, trades people and most importantly, customers. My VirtualHome™ is a freeware (free for non-commercial use) to customers. By involving customers in design and product selection process, as well as providing visualisation of the real product, it increases customers’ incentives for using the tool, and buying the products/services from the registered suppliers. On the other hand, the success of My VirtualHome™ relies heavily on registrations from suppliers and professionals in the industry for up-to-date range of products and product information to the customers. To achieve this, My VirtualHome Pty Ltd has an ongoing relationship with its suppliers, which is done through membership. Suppliers and professionals are exposed to supplier costs and methods. Other than word of mouth and marketing in magazines and television, the benefits of My VirtualHome™ are promoted to the suppliers through an education programme to increase awareness and buy-in of the service.

In order for My VirtualHome Pty Ltd to be sustainable in the long term, there are five levels of product and process development it must address. The five levels are sustaining development, enhancements, hybrids and derivatives, platform/next generation development, unique radical development and research and advance development (Burgelman *et al.*, 2004). A mix of product and process development initiatives to expand the membership base, such as improving the support for and performance of franchises, has assisted My VirtualHome Pty Ltd to sustain its development. In order to maintain a competitive advantage and its sustainability, the company is also rolling out enhancements and add-ons to the product including HomeShare, ProductShare, a landscape package and development of sister products for commercial applications such as shop and restaurant fit-outs, as well as providing services to the commercial building sector for the use of My VirtualHome™ to assist in tailoring interior fit-outs to suit individual tenant requirements. Radical development may include development of the My VirtualHome™ software to enable multiple users

to collaborate on the same design at the same time while at different locations as a collaborative design tool. This software provides an ICT platform for continuous collaborations between users at various project stages. All of these fit into the strategy of maintaining product leadership based on internal resource capabilities which intend to lead to a sustainable product and supply chain.

Case study 3 – stakeholder value, a sustainable supply chain and community benefit with a Dutch contractor

Company S is located in three cities in The Netherlands and is composed of four departments: the business department, the sales department, the realisation department and the support department – basically, a small front office with a large back office: this concept is unique to company S and crucial to its success. The company performs only negotiated, design build works and has established long-term relationships with all of its suppliers and subcontractors. So, how does this work and how can it be improved? The values of the company are to be creative and skilful partners of customers and deliver healthy, future-oriented office buildings at reasonable cost. Close collaboration with a wide variety of stakeholders from various backgrounds and professions, such as subcontractors, financiers, clients, investors, project developers, consultants, architects, project managers, real estate agents, local communities and tenants is essential for the business to thrive.

This case study explored the association between relationship management structures and processes and supply chain sustainability. A sustainable supply chain provides company S with a downstream resource that adds value to its product. Upstream, company S puts customers first and has long-term business relationships with many. By studying the organisational and individual characteristics within the “offices”, the authors identified emerging themes that facilitate sustainable relationships between company S and its customers and, hence, lead to long-term business success, community benefit and a sustainable supply chain.

The case confirmed the view that successful sustainable relationships in the supply chain rely on relational forms of exchange characterised by high levels of trust and commitment between project stakeholders. Collaboration and teamwork were seen to be crucial in the case: sharing up-to-date information and joint problem solving between participants leading to minimisation of errors, reduction of time delays and stimulates innovation, i.e. a reduction in transaction costs. This case also highlighted the formalisation of these issues through relationship management mechanisms allowing the evolution of a sustainable relationship between participants, e.g. suppliers, company S and clients, to the benefit of all. This was effectively moderated by the recent introduction of building information modelling (BIM) to demonstrate the building design, construction and facility operation processes in a building life cycle. As in the previous case, ICT has a catalytic role in establishing and maintaining relationships but the fundamental glue that holds the supply chain together is relationship management of individuals and companies, as illustrated below. These relationships have to be constantly maintained for sustainability to become a reality.

In order to gain a holistic view of the relationship between company S and the supply chain, contributions were sourced from two suppliers and two clients, with whom company S has existing working relationships, via a structured interview process. All interviews were conducted by the authors, accompanied by staff from

company S for English to Dutch translation (and vice versa) and clarification of certain terms. Contributions came from the director or senior manager of suppliers A and B, clients A and B.

Overall, the results indicate that the relationship between company S and the client/supplier organisations is regarded as worthwhile, indeed highly satisfying by the stakeholders. Also, both company S and the client/supplier organisations asserted that there is a high level of commitment from each party. The results suggest that a strong influence on the supply chain relationship is personal acquaintance. Strengths and weaknesses in company S's approach were identified as follows.

Areas of company S's comparative strength include:

- flexible and informal relationships allowing mutual adjustment; and
- company S's owner's charisma, essential in maintaining relationships.

Areas of comparative weakness include:

- lack of inter-organisation awareness, which leads to confrontation;
- discontinuous communication, which makes common objectives difficult to agree; and
- lack of clarity in contract terms and specifications that makes clear goal setting difficult.

Thus, issues of concern surfaced in regard to staff turnover including common problems of communication and information sharing, leading to reduction in project performance. Company S recognises a need to address this by revisiting its structure and internal procedures, and re-focusing on supply chain management.

Several interviewees believed there was not enough ongoing communication, especially after contract negotiation, between company S and the client/supplier group at the managerial level, leading to reduced project performance. However, interviewees indicated company S's flexibility and informal work procedures contributed to relationship development and so, subsequent success. Although these processes were relatively well accepted by the interviewees, a few general, underlying concerns surfaced:

- the level of understanding of project partners' goals;
- information exchange during and after project execution; and
- procedures for updating clients/suppliers on the current point of contact due to staff turnover.

Ironical as it might seem, informal communication is essential for relationship management but it needs to be undertaken in an appropriately structured environment with clearly laid-down procedures. These procedures include information sharing and more thorough transaction-specific, ongoing administrative processes. Effective supply chain relationship management requires clarity of purpose in communication and a carefully prepared and executed plan for engaging multiple project participants in both the upstream and the downstream supply chain.

Summary

The basic concepts and variables relating to cooperation, collaboration, organisational issues and performance have been examined in this paper. Cultural barriers to change

exist at both management and operational levels. The product My VirtualHome™ and relationship management, both have a similar objective, which is to achieve long-term relationship between clients/customers, suppliers and professionals. Relationship management brings professionals from different industry groups together by providing an interactive communication platform. It provides the setting for knowledge sharing and innovations which leads to cost and time saving. In this case, by establishing partnerships with suppliers, the public sector organisation can help suppliers to create value and material development; and on the other hand, suppliers can tailor-make products to suit client needs.

It has been shown that the degree of match and mismatch between organisational culture and structure has an impact on staff's commitment level. The concept of relationship management needs to filter down to all levels in the supply chain if participants are to retain commitment and buy-in to the relationship. By conducting the study in different technological and cultural contexts, the authors were able to validate the generalisations discussed above whilst also noting specific, culture-specific variations in the implementation of relationship management. This is a fruitful area for future studies.

A sustainable supply chain requires proactive relationship management and the development of an appropriate organisational culture, and trust. Relationship management will not succeed without parties' strong buy-in and commitment to the concept. Project parties need to recognise the benefits of relationship management. They also need to be familiar with relationship management principles and relationship management in practice for effective integration. This brings us to the last conclusion of this research, that education and training is an imperative element for achieving effective relationship management application. Relationship management culture must be championed in organisations through continuous training and in-house workshops. Relationship management culture and correct principles should be embedded in people's mindset at an early stage, e.g. through institutes and universities.

To summarise, benefits of relationship management include less paperwork and people feel their work to be more enjoyable. People are also more helpful, less destructive and more proactive. For relationship management to be successful, organisations must accept the existence of cultural mismatches and rationalise the existence of different cultures throughout the organisation. This message must be filtered through the organisation by legitimising individuals' expectations of the type of culture which is appropriate to the company and empowering employees to address these mismatches. All of these issues lead to a situation where the collaborating organisations may develop their competences symbiotically and so facilitate a sustainable supply chain.

From the foregoing, we have concluded that the sustainable supply chain depends on convergence (Figure 1). By this, we mean that the match between organisational structuring, organisation culture and organisation commitment are such that a common understanding permeates the organisation. Of course, this match and understanding take time to develop and must be developed concurrently and slowly within the client organisation and the contracting and sub-contracting organisations. As this area of convergence grows in the individual organisations, so the area of convergence between the two (or more) organisations also increases. In essence, this is the goal of sustainability in that the convergence of ideas, ways of thinking, economics

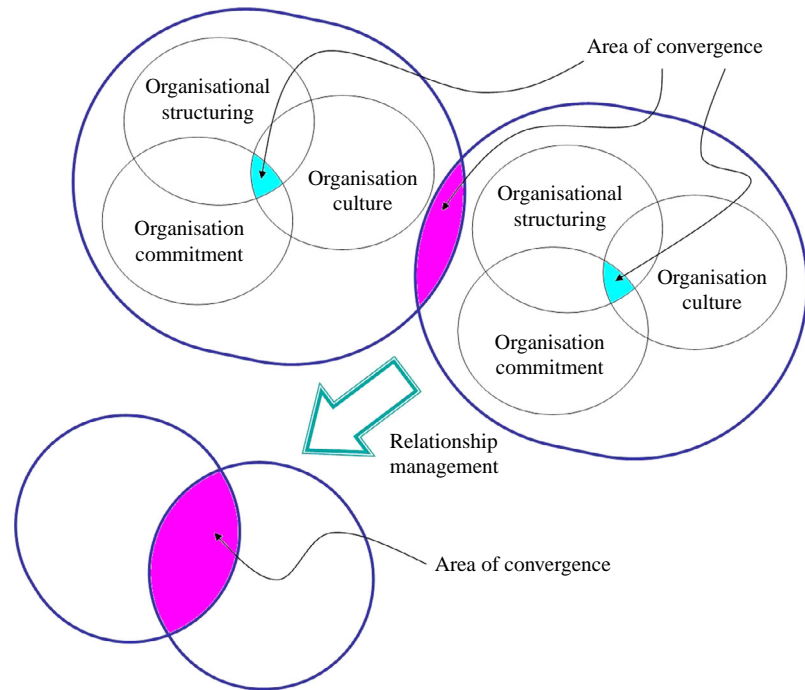


Figure 1.
The essence of sustainable
supply chain

and culture lead to a common understanding and shared goals. Hence, this research is predicated on the concept of convergence in terms of within organisations and between organisations i.e. that is inter- and intra-organisational convergence. The mechanism for developing this convergence is postulated to be the application of relationship management principles.

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