SCM and extended integration at the lower tiers of the construction supply chain: An explorative study in the Dutch construction industry

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Abstract

Several studies have underlined the potential of Supply Chain Management (SCM) in meeting the formidable challenges associated with fragmentation, adversarial relationships and insufficient customer focus in the delivery of construction projects (e.g. Dainty *et al*., 2001; Cox and Ireland, 2002; Gadde and Dubois, 2010). However, there remains a paucity of properly documented examples of successfully implemented SCM initiatives, particularly at the lower tiers of the supply chain. This study sets out to explore the enablers and barriers to the implementation of SCM at the lower tiers of the supply chain, particularly the problematic collaboration between main contractors and subcontractors. A SCM Maturity Model is developed based on Holti *et al*.'s (2000) seven principles of SCM organisation. An explorative study is conducted based on interviews from eight large main contractor and subcontractor organisations in the Dutch construction industry. Discouragingly, across the organisations, more barriers than enablers to supply chain management are identified. Organisations are found to be particularly struggling to compete through superior value, manage costs collaboratively, and develop continuous improvement within their supply chains. The findings also underline the low SCM maturity of main contractors and their inability to play the essential role of supply chain managers. Indeed the principles of integrating project activities and mobilising and developing people are found to be better exercised by subcontractors. The study may highlight the need for a greater degree of contractor leadership and improved internal organisation of both types of firms in order to achieve greater collaboration at the lower tiers of the construction supply chain.

Keywords: SCM, Construction supply chain, Contractor-subcontractor relationships, extended integration

1. Introduction

The construction industry is widely criticised for adopting highly adversarial and fragmented approaches to relationships, where design is separated from production and a lack of suppliers'

involvement exists at the early stages of projects (Egan, 1998; Chan *et al*., 2003; Bresnen and Marshall, 2000). Although fragmentation originally developed as a flexible way of dealing with highly variable workloads, it has resulted in complex contractual relationships and discontinuity of teams (Egan, 1998). Several studies have underlined the need for radically different approaches to supply chain relationships that achieve 'customer delight' and minimize turbulence in stakeholders' relationship (Latham, 1994; Cox and Ireland, 2002; Pryke, 2009).

In response to UK government reports such as Latham (1994) and Egan (1998), criticising the industry, there has been a move towards better supply chain integration and the formation of strategic partnerships and collaborative agreements between supply chain actors (Akintoye *et al*., 2000; Rimmer, 2009; Holti *et al*., 2000; Briscoe and Dainty, 2005). These approaches have been extensively adopted by parts of the industry as possible instruments for improving performance and inter-organisational relationships (Briscoe *et al*., 2004; Wood and Ellis, 2005; Akintoye and Main, 2007; Bygballe *et al.,* 2010). Arguably, these improvements are achieved through the adoption of a holistic approach by focussing on the network of relationships between supply chain actors involved in construction projects (Pryke, 2009).

However, there remains a paucity of properly documented examples of successfully implemented SCM initiatives, particularly at the lower tiers of the construction supply chain (Cox and Ireland, 2002; Gadde and Dubois, 2010). Construction projects are characterised by a high subcontractor/supplier involvement and rely heavily on subcontracting (Mbachu, 2008). Subcontracting has been adopted as the dominant procurement strategy as a consequence of the uncertainty faced by main contractors in obtaining continuous work and the need to accommodate the different, increasingly specialised and complex, requirements of each project (Morledge and Smith, 2013). However, while several studies underlined the importance of main contractor-subcontractor collaboration (Kale and Arditi, 2001; Wood and Ellis, 2005; Eom *et al,* 2008; Hartmann and Caerteling, 2010) opportunistic, arms-length and adversarial relationships are still prevalent among main contractor and subcontractor organisations (Greenwood, 2001). There appears to be a belief that existing SCM initiatives are adopted by contractors in order to increase their profitability at the expense of other members of the supply chain (Dainty *et al*, 2001). Where challenges arise, subcontractors and suppliers are often the most affected (Morledge and Smith, 2013).

This study sets out to explore the enablers and barriers to the implementation of SCM at the lower tiers of the construction supply chain, particularly the problematic collaboration between main contractors and subcontractors. Several studies have emphasised the need for collaborative relationships between main contractor-subcontractor organisations (Zou and Lim, 2006; Hartmann and Caerteling, 2010). The aim of this research study is to extend the existing debates on the issue by adopting an alternative approach focusing specifically on the internal SCM organisation of both main contractor and subcontractor organisations, and their direct inter-relationships. A SCM Maturity Model is developed according to relevant SCM concepts and based on Holti *et al*.'s (2000) seven principles of SCM organisation. The model is applied within the context of the Dutch construction industry and used to examine the SCM maturity of eight large main contractor and subcontractor organisations.

2. Conceptual development

2.1 SCM concepts

Supply Chain Management (SCM) first appeared as a term in the early 1980s with its core concepts primarily originating from the Japanese automotive sector (Womack *et al*., 2007; Peck, 2006). It is a new way of thinking about management and processes, in order to coordinate supply chains more efficiently, by managing the associated relationships to delivery customer value, through innovation and continuous improvement (Akintoye and Main, 2007; Pryke, 2009; Christopher, 2011; Meng, 2012). Harland (1996) categorises SCM into four different levels:

1. The management of an internal supply chain integrating the activities of a firm;
2. The management of a dyadic relationship between two immediately connected suppliers;
3. The management of a chain of businesses with which a firm has no contractual relationship; and
4. The management of a network of interconnected businesses involved in the ultimate provision of a product to customers.

The interest in adopting SCM techniques has been growing in the construction industry since the 1980s (Segerstedt, 2010). The management of the different levels proposed by Harland (1996) is necessary as they form an integral part within a greater context: the supply network (Harland, 1996). Dainty *et al*. (2001) and Pryke (2009) describe SCM in construction as the management of the network of relationships within which firms are embedded. A holistic view is required for each of these levels to ultimately contribute to performance improvement and customer delight within the industry (Pryke, 2009). This contribution is fundamental in the creation of competitive advantage, which reflects the influence of efficient and constructive network relationships on a firm's short-term financial position and long-term competitive power (King and Pitt, 2009; Van Weele, 2010).

Porter (1985) developed the concept of the 'Value Chain' which reflects the importance of a focus on value and relates to all activities, both inside and outside the firm that contribute to its delivery (Van Weele, 2010). Management objectives have therefore moved away from the attention focussed on the finite domain of a single organisation to deliver competitive advantage. Attention is now focussed on ensuring competitive advantage for the integrated supply chain (Green *et al.,* 2005). Lambert and Cooper (2000) affirm this paradigm shift, stating that businesses no longer compete as a sole business entity, but rather in a 'supply chain versus supply chain' manner. Pryke (2009) states that the main objective of SCM is to enhance mutual competitive advantage and that this can be achieved through improved relationships, integrated processes and increased customer focus.

In essence, SCM is based on integrating supply chain actors to enable the sharing of knowledge and information (Holti *et al*., 2000; Martinsuo and Ahola, 2010; Christopher, 2011). Under traditional procurement, firms have the tendency to withhold vital information, such as those relating to risk (Gann, 2000). Edkins (2009) points out that such practice can hinder collaboration and prevent the establishment of trust and long-term relationships. SCM is based on a 'holistic' management approach by bridging the gap between actors, thus, providing the supply chain with the flexibility in adapting to

changing client's needs, as uncertainties are reduced through the sharing of knowledge and information (Cox *et a*l., 2006; Pryke, 2009).

2.2 Towards SCM maturity in construction

Holti *et al*. (2000) offered an approach to managing a supply chain that provides support to supply chain actors and encourages collaboration. One of the main concepts is that all supply chain partners make contributions as team members, with no single discipline claiming a privileged view as to the nature of value (Holti *et al*, 2000). There is a tendency towards informality, a move away from contract management towards relationship management, and with it a demand for methods of effectively managing these new types of linkages between project actors (Pryke, 2009).

Holti *et al*. (2000) recommend a single point responsibility to effectively integrate supply chains. This is deemed to be necessary as construction supply chains are fragmented, complex, highly uncertain and with many stakeholders, requiring a leading actor to coordinate the process and relationships. It is believed that contractors have more influence on the organisation of the project and on the performance and quality of the work of its subcontractors/suppliers (Latham, 1994). Despite the fact that they have such an important role in channelling client demand through their own supply chains, contractors are overlooked when it comes to research and useful advice (Pryke, 2009). Holti *et al*. (2000) acknowledge a potential leading role for the contractor. Their approach is based on the following seven principles, described as essential ingredients for a construction company to function in a SCM-driven environment:

Figure 1: The seven underlying principles (Holti et al., 2000)

1) **'Compete through superior underlying value'**
   The first principle centres on enhancing the value of what is actually delivered by the supply chain by improving quality and reducing underlying costs. All members of the construction supply chain therefore, use their capabilities to take the 'right' costs out. This main principle embraces all the other six (see Fig. 1).

2) **'Define client values'**
   Holti *et al*. (2000) define client value as a built-up of the functional requirements, the design character and the target through-life cost profile for the desired building. The latter is a more in-depth approach to value, which requires knowledge of both capital and operational costs.

3) **'Establish supplier relationships'**
   The procurement and delivery method influence the performance of the entire supply chain and the outcome of the project. This principle encompasses commitment to forming long-term relationships with a small number of suppliers in each key supply category around major and core-business.

4) **'Integrate project activities'**
   Whereas the preceding principle focuses on the decision on strategic long-term partners, this principle describes a mechanism for effective management of the partners that collaborate on a project. The goal is to resolve all the design-related issues at key interfaces at an early stage by creating clusters and simultaneous engineering, with specialist suppliers involved early in the process to create commitment to subsequent phases.

5) **'Manage costs collaboratively'**
   This principle necessitates the involvement of all members of the supply chain with the knowledge and skills needed for a particular decision. It employs a unique approach to dealing with and managing costs, referred to as 'target costing'. The approach involves suppliers working backwards from the client's functional requirements and the maximum market price of the item and is supported by two mutually reinforcing techniques: Value and Risk Management.

6) **'Develop continuous improvement'**
   The central role of continuous improvement is to achieve decreasing prices and/or improving functionality and value for future projects. It is a vehicle for achieving long-term performance improvement, with the help of techniques such as lean principles and kaizen events, and to make these a regular, reliable and long-lasting occurrence by taking control of the supply chain (Blanchard, 2010).

7) **'Mobilise and develop people'**
   Adopting all these principles imposes substantial cultural changes on the construction industry which must be accompanied by great commitment in order to drive progress and achieve the strived benefits. Part of SCM therefore, includes the mobilisation and development of employees so that the human workforce excels through the benefits of the SCM approach.

The seven principles outlined above demonstrate that implementing SCM encompasses the recognition of essential SCM elements internally, within an organisation. The aim of this research study is to underline the challenges on the path towards becoming a well-functioning or 'mature' SCM organisation within an interdependent supply chain in main contractor and subcontractor organisations. For this reason Holti *et al.*'s (2000) principles are used as a framework and transformed into a usable maturity model, as will be explained in the next section.

3. Research method

Given the exploratory nature of the study, a qualitative approach was considered the best-suited for this research (Blumberg *et al*, 2011). Data collection was largely based on primary data, which, building on Yin (2003), was gathered from semi-structured interviews with representatives from main contractor and subcontractor organisations. Four large main contractors and four larger subcontractors, operating in the Dutch construction industry, were included in the research. The participating companies, like most other European firms, were confronted with a difficult economic climate, during the period of this research, characterised by increasing competitive pressures and profit demands. The research was limited to the managerial level of the companies and involved respondents with the responsibility of implementing SCM. Table 1 provides an overview of the participating companies and representatives.

Table 1: Overview of companies involved

MAIN CONTRACTORS			
Name	***Position***	***Company***	***Company Profile***
Interviewee 01	*(Ex-)Director Purchasing*	*Ballast Nedam (BN)*	*Building and development, infrastructure, services and specialist activities.*
Interviewee 02	*Director Purchasing*	*Royal BAM (BM)*	*Construction, mechanical/electrical services, civil engineering, property and PPP.*
Interviewee 03	*Director*	*Dura Vermeer (DV)*	*Construction, real estate and infrastructure.*
Interviewee 04	*Director*	*Waal (WB)*	*Housing, social/commercial properties, and renovation.*

SUBCONTRACTORS			
Name	***Position***	***Company***	***Company Profile***
Interviewee 05	*General Director*	*De Groot and Visser (GV)*	*Supplier/manufacturer of aluminium windows, facades, doors and blinds.*
Interviewee 06	*Business Leader*	*Geelen Beton (GB)*	*Precast concrete floor systems and other concrete construction elements.*
Interviewee 07	*Director*	*Trijselaar Vermeer (TV)*	*Plumbing and sanitary installation company.*
Interviewee 08	*General Director*	*Berkvens (BV)*	*Manufacturer of the interior door/frame package.*

A general group session was organised to introduce the process of primary research. This session clarified the exact research topic, refined the research aims and values, and shaped the following methodology together with the interested companies. It was decided to adopt a two-stage approach. First, a series of eight individual open discussions was held to explore the perspectives of the companies involved with regards to their role and their partners' role within the SCM relationships and the existing barriers inhibiting integration and collaboration.

It was surfaced that the companies involved have several uncertainties regarding their own and their partner's position and role in an effective SCM collaboration. It seemed that most barriers in the relationship flow from these uncertainties and that chain integration cannot be established when the parties involved are not SCM-organised themselves. The second stage of the research thus focused on the analysis of the current SCM status of all individual companies involved. The themes and

accompanying questions for this analysis were derived from the seven principles that Holti *et al*. (2000) describe in their 'Handbook for SCM' as essential ingredients for an SCM organisation. Appendix 1 outlines the developed SCM Maturity Model. The SCM maturity levels in the model were developed after the interviews were held, and thus the range of answers given by the participants influenced the five different levels established per theme. The model thus provides a relative comparison of SCM maturity among participating companies rather than an absolute measure.

4. Research findings

This section presents the research findings. It should be noted that the research findings have limitations presented by the chosen research methodology. The findings concern only eight main contractor and subcontractor organisations. Therefore, as Yin (2003) argues, the findings stemming from this type of methodology are merely hypotheses that need to be confirmed or rejected. In order to be representative of the industry, the research findings need to be tested using quantitative research.

4.1 The SCM Maturity Model

The analysis of the research findings is based on the developed SCM Maturity Model which attempts to measure the SCM maturity level of the companies involved in the research. Emphasis is placed on the current characteristics of the organisation and its level in implementing SCM. The scores achieved in relation to the seven themes are summarised in Table 2 below.

Table 2: Overview of the themes

	BN	*BM*	*DV*	*WB*	*GV*	*GB*	*TV*	*BV*
General								
Insight into the construction supply chain	*0*	*2*	*2*	*2*	*0 / 1*	*1 / 2*	*3 / 4*	*3 / 4*
Principle 1: Compete through superior value								
Insight into profit/turnover level	*0*	*1*	*2*	*0*	*0 / 1*	*0 / 1*	*2*	*2 / 3*
Value adding activities and wastage	*-*	*0*	*2*	*2*	*1*	*1*	*2*	*2 / 3*
Principle 2: Define client values								
Client's wishes and specifications	*0 / 1*	*2 / 3*	*3*	*1 / 2*	*1 / 2*	*1*	*3 / 4*	*1*
Customer delight	*1*	*2*	*3*	*3*	*1*	*3 / 4*	*3*	*3*
Principle 3: Establish supplier relationships								
Black box of subcontracting	*0*	*1*	*1*	*3*	*1 / 2*	*1 / 2*	*2*	*2 / 3*
Strategic partners	*0*	*3*	*1*	*2*	*1*	*2*	*3*	*3*
Principle 4: Integrate project activities								
Partner involvement	*1*	*1*	*1 / 2*	*2*	*1 / 2*	*2 / 3*	*2 / 3*	*2*
Integration of processes	*0*	*0*	*2 / 3*	*2 / 3*	*1 / 2*	*2*	*2*	*2*
Principle 5: Manage costs collaboratively								
Initial price	*2*	*1 / 2*	*2*	*2*	*1*	*1 / 2*	*1 / 2*	*1 / 2*
Risk management	*1*	*1*	*3*	*1 / 2*	*0 / 1*	*2*	*2*	*2 / 3*
Principle 6: Develop continuous improvement								
Continuous improvement	*0*	*1*	*3*	*1*	*0 / 1*	*1*	*1 / 2*	*3*
Principle 7: Mobilise and develop people								
Development of people	*0*	*2*	*2 / 3*	*1 / 2*	*1 / 2*	*3*	*3*	*3*

The individual ratings as shown in this table mirror the status of each participating organisation against Holti *et al*.'s (2000) ideal SCM organisation. The table shows scores that range between 0 and 3 and just occasionally reach higher than 3, for both contractors and subcontractors. As set out in Section 2, the construction industry is known to be a challenging industry for SCM implementation (Gadde and Dubois, 2010). The ratings achieved for Principle 1, 5 and 6 are the lowest across the seven principles.

Principle 1 'Compete through superior value' requires insight into the built-up of costs and clarity about 'right' and 'false' costs, however, this clarity seems to be missing. As interviewee 02, BM commented: "*The construction world is familiar with the concept of failure costs, but nobody knows how much these costs really are or even what the real definition is*" *(interviewee 02, BM).* Findings in relation to Principle 5 'Manage costs collaboratively' reflect practices that favour short-term financial gains in the difficult economic climate currently facing the firms, such as non-legitimate risk transfer, contradicting SCM. Principle 6 'Develop continuous improvement' was found to be a well-understood principle, however doubts exist on how to correctly implement it in an industry characterised by one-off projects. Some of the issues raised by interviewees were the difficulty of applying project-specific knowledge to other types of project (interviewee 01, BN) and the fact that knowledge, particularly tacit knowledge, often resides with people (interviewee 07, TV).

4.2 A relative comparison of main contractors and subcontractors

In comparison between the two types of companies, it is easily noticed that Principle 4 and 7 are better exercised by subcontractors. Principle 4 'Integrate project activities' encompasses the involvement of partners and the integration of processes and activities, which due to subcontractor's greater specialisation is found to be more straightforward to manage. For example, one subcontractor company depends on long-terms strategic partners for 70% of their contracts (interviewee 07, TV), another works with the same supplier of sand, grind and cement (interviewee 06, GB) or many partnerships involve commodities (interviewee 05, GV). Principle 7 'mobilise and develop people' could be explained with similar reasoning as individuals are of greater importance in the delivery of actual value in relation to their particular speciality. In addition, although the variation in scores is not high, it should be noted that main contractors, largely considered by Holti *et al*, (2000) as the leaders of SCM implementation, do not score particularly high in order to take up that role.

4.3 Effect on contractor-subcontractor relationship

Although the focus of the SCM maturity model lies essentially on the internal organisation of the companies, the data collected shows that a company's processes and activities are interrelated with the processes and activities of its surrounding companies. This shows the impact of partners, or even the entire supply chain, on the individual implementation of effective and efficient SCM. In other words, the way in which an individual company implements SCM might influence the implementation of SCM in the relationship, chain and network. This refers to the first two related SCM uses as described by Harland (1996).

The findings indicate that principle 3 'Establish supplier relationships' influences the basis for partnerships and the degree of trust, certainty and respect. Interviewee 02, BM, for example, spoke about the importance of reciprocity for a valuable partnership and interviewee 04, WB, about the necessary equal perceptions on collaboration. In order for Principle 1 'Compete through superior value' and 5 'Manage costs collaboratively' to work, insight in relation to value, costs, risk and profit is needed which demands an increase in transparency and openness. This necessary increase is confirmed through examples such as improved discussions that take place when using self-developed sheets or checklists (interviewee 07, TV), initiatives that develop during in-depth discussions of material use and processes (interviewee 06, GB) and joint risk calculations (interviewee 08, BV). Principle 2 and 4 relate to communication, demonstrated for example by how interviewee 03, DV, values both client and partner sessions. Principle 6 and 7 relate to communication, commitment and a change of thinking. As interviewee 01, BN commented: *"There is no truth in the construction industry. All projects are unique and therefore, an exception and each project comprises a new belief system and set of rules. This inhibits the recognition people are able to find in solutions that are offered to the industry" (interviewee 01, BN).*

5. Conclusion

SCM can support the move away from traditional adversarial relationships prevalent in construction supply chains and provides an opportunity for the delivery of more value to clients. This value is derived through collaborative working, easier knowledge transfer and the creation of long-term effective working relationships. This research focuses on collaboration at the lower tiers of the construction supply chain, particularly the problematic collaboration between main contractors and subcontractors. All participating companies were found to be aiming at a similar outcome: performance improvement in order to create competitive advantage in the difficult economic climate they were facing. Despite their familiarity with SCM, and their enthusiasm and willingness to create the best environment in order to implement SCM appropriately, the construction industry was described as challenging with characteristics that obstruct successful implementation of SCM. The SCM maturity model proved to be valuable in reflecting the environment in which the participating companies attempted to deal with SCM, and to discover the particular elements that either enabled or inhibited SCM implementation. The seven principles by Holti *et al*. (2002) remained central throughout the entire research.

Discouragingly, across the organisations, more barriers than enablers to supply chain management were identified. Organisations were found to be particularly struggling to compete through superior value, manage costs collaboratively, and develop continuous improvement within their supply chains. The findings also underline the low SCM maturity of main contractors and their inability to play the essential role of supply chain managers.

In terms of managerial implications, the study may highlight the need for a greater degree of contractor leadership and improved internal organisation of both types of firms in order to achieve greater collaboration at the lower tiers of the construction supply chain. In addition, the SCM maturity model developed may work as an improvement framework that could be applied to main contractors'

and subcontractors' SCM activities towards extended integration and through this, a more collaborative relationship.

Research is currently undertaken in order to quantify the different levels of SCM maturity, including useful and known 'best-SCM-practices' to allow an absolute SCM comparison and to guide construction companies better in their growth towards SCM maturity. Moreover, the model will be adapted to focus analysis on subcontractor maturity more towards the relationship with its contractor rather than with its own subcontractors/suppliers.

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Appendix 1: SCM Maturity Model

PRINCIPLE 1: 'COMPETE THROUGH SUPERIOR VALUE'

Insight into profit/turnover level	
0	No insight
1	Information related available
2	Engagement in discussions
3	Involvement and contribution to this level
4	Reciprocal contribution to this level

PRINCIPLE 2: 'DEFINE CLIENT VALUES'

Client's wishes and specifications	
0	Client's wishes and specifications received
1	Direct contact and discussion with direct client
2	Direct contact and discussion with final client
3	Wishes and specifications openly communicated through to partners
4	Wishes and specifications openly discussed with client and partners
Customer delight	
0	Customer delight is not considered
1	More is done to discover the real wish of the client
2	Value is reviewed
3	Customer delight is considered
4	Investment in customer delight without direct benefit

PRINCIPLE 3: 'ESTABLISH SUPPLIER RELATIONSHIPS'

Black box of subcontracting	
0	Criteria for subcontracting do not really exist and are not shared
1	Criteria for subcontracting are established
2	Criteria for subcontracting are project exceeding and based on best project outcome
3	Criteria are shared with all partners
4	Criteria are sustainably applied and in line with commonly identified goal of supply chain
Strategic partners	
0	No distinction is made between strategic/key and normal partners
1	Awareness of distinction exists
2	Long-term partnerships are established
3	Strategic long-term partnerships exist
4	More than one strategic long-term partnerships exist within each key supply category
Power leverage	
	Power and responsibilities shift all the time

PRINCIPLE 4: 'INTEGRATE PROJECT ACTIVITIES'

Partner involvement	
0	Partners are not involved in the process
1	Partners are involved in the process
2	Partners are involved as soon as own involvement starts
3	Partners are involved before own involvement starts
4	Partners get involved as cooperating construction supply chain
Integration of processes	
0	Processes are not integrated and many problems occur at interfaces
1	Internal processes are aligned with company's strategy/goals
2	Internal processes are integrated; problems related to external non-integration
3	External process are integrated; simultaneous/concurrent engineering
4	All processes are aligned with strategy/goals of construction supply chain

PRINCIPLE 5: 'MANAGE COSTS COLLABORATIVELY'

Initial price	
0	No commitment to initial price; initial price unrealistic
1	Initial price realistic, based on information received; occasional claiming
2	Competent people and/or partners are involved in improved price calculation
3	Construction supply chain tries to stick to initial price; transparent price calculation
4	Target-costing approach in construction supply chain
Risk management	
0	No awareness of risks; risks are transferred as much as possible
1	Awareness of risks; risks are transferred as much as possible
2	Awareness of risks; (some) risks are absorbed
3	Risks are discussed with partners; (some) risks are absorbed
4	Risks are actively managed and avoided

PRINCIPLE 6: 'DEVELOP CONTINUOUS IMPROVEMENT'

Continuous improvement	
0	No continuous improvement
1	Activities on continuous improvement exist within company
2	Awareness of activities of partners on continuous improvement
3	Involvement in partner's activities on continuous improvement
4	A jointly appraisal scheme of targets related to continuous improvement exists
Standardisation/Specialisation	
	Standardisation in certain formulated product niches

PRINCIPLE 7: 'MOBILISE AND DEVELOP PEOPLE'

Development of people	
0	No commitment
1	Awareness of people's experiences and commitment within company
2	People are informed and involved in the company's development
3	People are actively developed
4	Construction supply chain is used in the development of people