

This article is © Emerald Group Publishing and permission has been granted for this version to appear here (<https://dspace.lib.cranfield.ac.uk/index.jsp>). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.

[www.emeraldinsight.com](http://www.emeraldinsight.com)

## **Inter-organisational costing approaches – the inhibiting factors**

Marko Bastl<sup>1</sup>, Tonci Grubic<sup>2</sup>, Simon Templar<sup>1</sup>, Alan Harrison<sup>1</sup>, Ip-Shing Fan<sup>2</sup>

<sup>1</sup>*Supply Chain Research Centre, Cranfield School of Management, Cranfield, United Kingdom*

<sup>2</sup>*Manufacturing Department, School of Applied Sciences, Cranfield, United Kingdom*

### **Abstract**

**Purpose** – The purpose of this paper is: a). to highlight the limitations of current accounting practices in inter-organisational context; b). to introduce contemporary costing approaches used in inter-organisational costing (IOC) programmes and c). to identify the inhibitors of successful implementation of IOC programmes.

**Methodology/Approach** – The research uses a structured review of empirical and theoretical literature.

**Findings** – Traditional accounting practices do not adequately fulfil their role in the inter-organisational context. Contemporary accounting practices overcome only some limitations of traditional accounting practices. The study uncovers part of the complexity surrounding the implementation of IOC programmes and suggests that we are dealing with a broad inter-disciplinary phenomenon.

**Research limitations** – Conclusions are drawn on a conceptual level and further empirical investigation is encouraged.

**Practical implications** – The research raises the awareness of the complexity the surrounds the implementation of IOC programmes. The broad set of inhibiting factors could be effectively used by managers to assess the readiness of organisations involved in implementation of inter-organisational costing programmes.

**Originality/value** – This research is the first that systematically addresses the problem of inhibitors in the implementation of inter-organisational costing programmes. The broad scope of the paper sets the foundations for more focused research into specific inhibiting factors.

**Keywords:** Intra- and inter-organisational costing, Supply chain management, Inhibiting factors

**Paper type:** Literature review

## 1 Introduction

The transition from a supply chain made up of individual competing entities to one where organisations come together to form an externally integrated supply chain which extends both upstream and downstream was predicted by Stevens (1989). Thus the successful management of these inter-organisational relationships is crucial to achieve Christopher's (1998, p. 16) criteria of increased value and overall cost reduction. Cooper and Slagmulder (2003a) argue that only by the joint efforts of every partner working together will they achieve the common goal of reducing the overall cost of the supply chain operation. Over the last two decades the management of these inter-organisational relationships has become a research topic of substantial importance (Oliver, 1990; Ellram, 1995; Dyer and Singh, 1998; Håkansson and Ford, 2002; Dekker, 2003; Terpend *et al.*, 2008, Koulikoff-Souviron and Harrison, 2007). If one of the key measures of this inter-organisational approach is cost reduction, then there is a need to develop a management costing approach that can both measure the reduction of total cost throughout the supply chain and then is able to act as an enabler to distribute these cost savings amongst the collaborators.

Dekker and Van Goor, (2000) argue that the role of management accounting in inter-organisational relationships still lacks clear determination. It is recognised as important when it comes to, for example; make-or-buy decision making, (Seal *et al.*, 1999) or information-sharing for development of trust between parties in a relationship (Tomkins, 2001). Supply chain literature is not short of calls for increased sharing of information in supply chains (Ellram and Hendrick, 1995; Kemppainen and Vepsalainen, 2003; Myhr and Spekman, 2005): sharing of costing information is considered as particularly important (Kemppainen and Vepsalainen, 2003) to gain benefits such as reduction of total supply chain costs, among others.

The role of the management accountant as the provider of timely, accurate and relevant financial information to enable supply chain managers to make and execute effective

decision-making is of vital importance to achieving cost. In this context traditional accounting practices have been criticised as being unable to deliver an inter-organisational focus and associated costing information. To provide additional focus and relevance to existing practices in an inter-organisational context, various costing approaches have been introduced in past decades such as activity based costing (ABC), direct product profitability (DPP), cost to serve (CS), total cost of ownership (TCO) and target costing (TC). According to Kulmala *et al.*, (2002, p.37) these costing approaches can be applied in an inter-organisational context to address the objective of “finding lower cost solutions than would be possible if the firm and its buyers and suppliers attempted to reduce costs separately” (p. 37).

In this paper we define inter-organisation costing (IOC) programmes as “an approach to managing costs through joint efforts of the organisation and its customers and suppliers”. By doing so our definition encompasses the following characteristics:

- a. The management of costs (La Londe and Pohlen, 1996; Kulmala *et al.*, 2002; Cooper and Slagmulder, 2003a, 2003b), which essentially employs various costing approaches to the supply chain;
- b. Joint-cooperative efforts (Kulmala *et al.*, 2002 and Cooper and Slagmulder, 2003a) and;
- c. Involvement of upstream and downstream parties (La Londe and Pohlen, 1996 and Kulmala *et al.*, 2002)

Scholars as well as practitioners have been reporting that successful implementation of inter-organisational costing (IOC) approaches will deliver benefits such as increased visibility of product profitability (LaLonde and Pohlen, 1996), improvements in business relationships (Doherty *et al.*, 1993), better understanding of the true costs of doing business (Lin *et al.*, 2001, Zsidisin *et al.*, 2003), transmission of competitive pressures upstream of a supply chain (Cooper and Slagmulder, 2003a), increased knowledge of firm’s business processes and process-related costs (Stapleton *et al.*, 2004) and improved decision making (Blocher *et al.*, 2005). In spite of the recognised benefits, a limited adoption of IOC programmes among organisations irrespective of industrial sector has been revealed (Borin and Farris, 1990; Doherty *et al.*, 1993; Ellram, 1994; Ellram and Siferd, 1998; Cooper and Slagmulder, 1999; Ferrin and Plank, 2002; LaLonde, 2003).

The aim of this paper is to review the relevant empirical and theoretical literature to extract the possible reasons for limited implementation of IOC approaches. We aim to contribute to the existing body of knowledge and to inform supply chain practice with regard to the implementation of IOC approaches by addressing the following objectives:

- To highlight the limitations of traditional costing approaches to provide inter-organisational supply chain management information;
- To introduce five of the most commonly used approaches to provide IOC information; ABC, DPP, CS, TCO and TC and;
- To identify the inhibiting factors that might prevent successful implementation of IOC approaches in organisations and encourage more detailed investigations on how to overcome them in the future.

The paper is structured in line with the objectives; firstly it touches on current accounting practices, where it highlights major issues from the supply chain point of view. Then it introduces the five of the most commonly used accounting practices in IOC programmes. Next we introduce the methodology on selection and analysis of sources of evidences that we have used for identification of inhibiting factors. We then present and discuss the identified inhibitors, and end with conclusions and research limitations.

## **2 Criticism of traditional accounting approaches**

Roles that accounting practices need to fulfil in an inter-organisational context are different to the level of a single organisation. Traditional accounting practices, mainly represented by standard costing, often do not fulfil inter-organisational roles well enough to be considered relevant for decision making support. This section highlights these roles and unveils the most common areas of criticism of traditional accounting practices.

From a broad perspective the roles of management accounting in both, intra- and inter-organisational contexts share some commonalities. For example management accounting should: a). provide decision making information and knowledge at strategic and operational level (Axelsson *et al.*, 2002; Kulmala *et al.*, 2002) and b). ensure that this information is timely and relevant to managerial decision making, both in the long- and short-term. Inter-organisationally management accounting confronts with additional requirements. Provided information needs to support decisions that may affect not only a

focal firm but also its parties in an organisation's relationships. In this new and extended role management accounting would typically support provision of information for: a). make-or-buy decisions that could result in development of a partnering relationship; b). for actual management of strategic partnerships; c). for management of performance measurement systems (Seal *et al.*, 1999) and d). management of tasks to be performed in the relationship and development of trust in business relationships (Tomkins, 2001).

Traditional accounting practices are weak at addressing inter-organisational roles. This is reflected in a growing dissatisfaction and criticism from both scholars and practitioners. Hughes (2005) for example states that although the information may be accurate, it is often late, irrelevant and misleading. A similar critique exposes financial reporting as being too late, too aggregated (Johnson and Kaplan, 1987) and too distorted (Christopher, 2005) to be relevant for managerial planning and decision making. In a supply chain context, the situation is made worse. Traditional accounting practices are seen as an inappropriate to sufficiently address the integrative and process-oriented nature of supply chains. The views of why is that come down to the following:

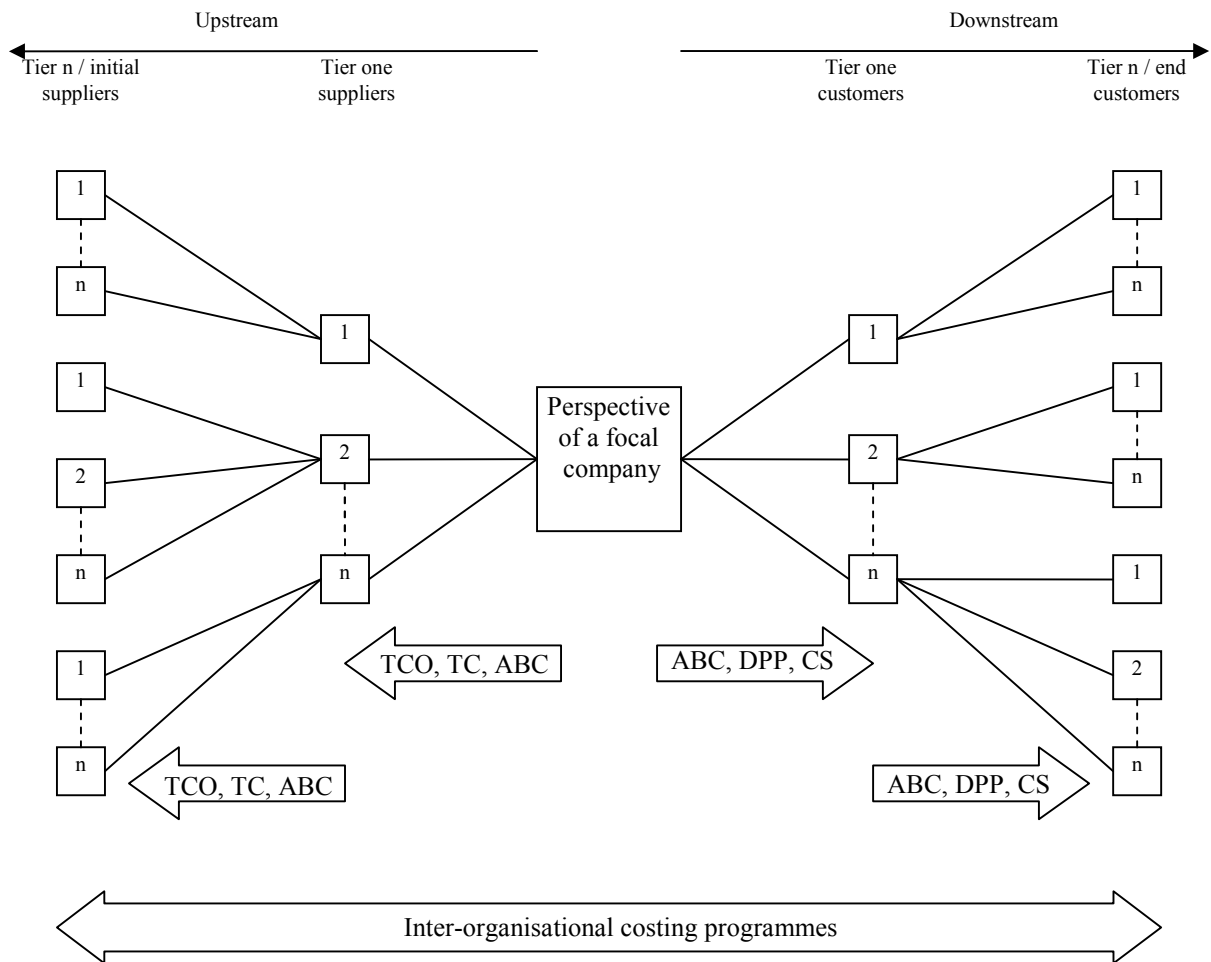
- Information captured using standard costing is insufficient for determining costs related to supply chain processes (Cokins, 2001).
- Standard costing as a cost assessment tool for identifying inter-organisational cost reduction opportunities is not suitable for its limited intra-organisational scope (Cooper and Slagmulder, 1998; Kulmala *et al.*, 2002; Mena *et al.*, 2004; Christopher, 2005).
- Standard costing does not reflect the burdens in variations in terms of: rate of sale, inventory levels, holding costs and obsolescence, changeover times in manufacturing and costs of ordering and administration (Braithwaite and Samakh, 1998).
- Costs are captured at too high level of aggregation (Christopher, 2005).
- Standard costing does not encourage improvements (Gupta and Gunasekaran, 2004).

In the attempt to overcome some of these shortcomings various different costing approaches have been developed in recent decades. The next section is providing the overview of the most commonly used costing approaches in IOC programmes.

### 3 Contemporary costing approaches

IOC programmes utilise various different costing approaches. However, these costing approaches differ as we move across the supply chain (see Figure 1). On the upstream side of a focal firm, approaches like TCO, TC and ABC are normally applied, where on the downstream side are ABC, DPP and CS (LaLonde and Pohlen, 1996; Templar *et al.*, 2004). Definitions and characteristics of each of these techniques are outlined in the continuation of this section.

**Figure 1: Costing approaches within inter-organisational costing programmes**



#### 3.1 Activity Based Costing

Activity based costing (ABC) is defined in numerous ways. CIMA (2000) defines ABC as: *“An approach to the costing and monitoring activities, which involves tracing resource consumption and costing final outputs. Resources are assigned to activities and activities*

*to costs objects based on consumption estimates. The latter utilise cost drivers to attach activity costs to outputs”.*

The origins of ABC can be found as far back as before the Second World War (Lin *et al.*, 2001). ABC’s attractiveness has increased with a rising awareness of the shortcomings of traditional accounting systems where indirect costs are allocated to products on a volume-related base (Lin *et al.*, 2001; Armstrong, 2002), i.e. via indirect labour.

ABC is primarily concerned with the assignment of resource costs to cost objects (Blocher *et al.*, 2005); such as products, services or customers based on activities performed for the cost objects. Direct and indirect costs are assigned to cost objects. Assignment of costs is a two-stage procedure (Blocher *et al.*, 2005). In the first stage overhead costs are assigned to activity cost centres (or pools) by using appropriate resource consumption cost drivers. In the second stage costs of activities or activity cost pools are assigned to cost objects using appropriate activity consumption drivers that measure the demand cost objects place on the activity or pool of activities (Blocher *et al.*, 2005).

According to some, ABC helps to uncover the true costs of business (Lin *et al.*, 2001), provides a better decision making basis and support for cost control, better profitability measures of products, services or channels, and better provision of controlling capacity costs (Blocher *et al.*, 2005). Nevertheless, we need to be realistic about ABC’s “capabilities” as a panacea for overcoming all the shortcomings of traditional accounting systems and achieving goals of inter-organisational costing initiatives. Concerns are pointed mainly towards ABC’s implementation difficulties (Kaplan and Anderson, 2004), inability to identify value and non value added activities in organisations (LaLonde and Pohlen, 1996), and inability to capture the whole complexity of actual operations in organisations (Kaplan and Anderson, 2004).

### **3.2 Direct product profitability**

Direct product profitability (DPP) is defined by CIMA (2000) as a technique “*used primarily within the retail sector. DPP involves the attribution of costs other than purchase price (e.g. distribution, warehousing and retailing) to each product line*”.

DPP first appears in an article by Bookbinder and Zarour (2001) and in this time is no longer used. However in terms of lessons learned from the implementation and use of this approach it is appropriate to include it in the review. DPP emerged as a result of growing concerns in the retail sector about the profitability and costs of individual products and stock keeping units. DPP was the first serious attempt to determine costs of products beyond the boundaries of a focal firm. Traditionally decision makers in the retail sector had relied on gross profit or gross margin for measuring performance (LaLonde and Pohlen, 1996). These measures exclude the costs associated with handling, warehousing, freight, discounts, allowances and direct labour, which significantly vary from one product to another. DPP takes these costs in the account.

According to Doherty *et al.* (1993) a major benefit associated with the use of DPP is its potential for improvements in supplier-retailer relationships. Through an increased visibility of costs and the provision of more detailed costing data both parties in the relationship have the potential to increase mutual understanding of product and supply chain costs. The method cannot be used for encompassing total company costs, as it excludes fixed overhead costs and administrative expenses (LaLonde and Pohlen, 1996). DPP is a static measure, which does not reflect the effects of changes in shelf-space, or of the benefits of increased sales of item B caused by item A (Bookbinder and Zarour, 2001).

### **3.3 Cost-to-Serve**

Cost-to-Serve (CS) is described as a method for capturing external supply chain logistics costs, aiming to identify and analyse drivers of costs associated with different product families, different sales channels and different customers (Braithwaite and Samakh, 1998, Norek and Pohlen, 2001; Ross *et al.*, 2007).

Some organisations have realized that sales volumes do not necessarily mean profit. The profit is a difference between the price and the actual cost to serve (Templar *et al.*, 2004). This implies that customers should be managed for profit and not only for sales revenue. CS is a method that allows more accurate costing in respect to specific product family, sales channel or customer. In its essence CS is a form of ABC applied on the downstream side of a supply chain. In order to understand the costs and drivers a method of collecting costs, mapping process activities and analysing the data, similar to ABC is employed.



Braithwaite and Samakh, (1998), Ross *et al.*, (2007), demonstrated that this method help organisations determining costs of product variety, managing customer channels, achieving customer service objectives and improving distribution network. The main challenges with implementation of this approach are again very similar to challenges described for ABC. Braithwaite and Samakh, (1998) however showed that achieving the right level of detail in crucial for CS model to allow on one hand for a meaningful analysis and on the other for maintainability of the whole costing system.

### **3.4 Total Cost of Ownership**

Total Cost of Ownership (TCO) is defined by Ellram and Siferd (1998) as a “purchasing tool and philosophy aimed at understanding the relevant costs of buying a particular good or service from a particular supplier” (p. 56).

TCO emerged in the 1980s with the aim of better understanding the total costs associated with the purchase of goods or service from a specific supplier (Zsidisin *et al.*, 2003; LaLonde and Pohlen, 1996). The focus of TCO is on a firm’s interfaces with suppliers to support decisions related to sourcing strategy (Wouters *et al.*, 2005). TCO recognises that purchase price does not encompass all costs associated with the purchase and that the total costs of acquiring the product or service from a specific supplier also depends on the supplier’s performance (LaLonde and Pohlen, 1996). Costs affected by a supplier’s performance and thus need to be included in the TCO analysis are, according to LaLonde and Pohlen (1996), costs of ordering, expediting, receiving and inspecting. In addition, Ellram (1994) also recommends costs associated with supplier search and qualification, tariffs and duties, warehousing as costs related to the use of specific good or service such as; downtime caused by late, defective and incomplete shipments, warranty work, or customer returns associated with defective/poor quality material or components. There is no general rule about which costs precisely should be included in the TCO analysis. Any decision will largely depend on the relative importance that those costs have for a specific good or service.

According to Zsidisin *et al.*, (2003) TCO helps organisations gain a long-term, system-oriented understanding of the true cost of doing business but it does not show how a focal

firm's behaviour may affect the upstream organisation's costs (LaLonde and Pohlen, 1996).

### **3.5 Target Costing**

Target costing (TC) is according to Cooper and Slagmulder (1999) a technique to strategically manage a company's future profits. Target costing (TC) is often used as the main tool in inter-organisational cost management (Axelsson *et al.*, 2002) and usually practiced in the new product development stage (Cooper and Slagmulder, 1999; Smith and Lockamy, 2000; Ellram, 2000; Dekker and Smidt, 2003; Ellram, 2006).

The selling price is an organisation's estimation of the market price that can be achieved. The total target cost allowed for the product or service equals estimated sales price less desired profit (Ellram, 2002a, 2006). The first process in TC is the definition of a product's functionalities and features, and based on this, an estimation of sales price and profit calculation (Axelsson *et al.*, 2002). The second process is achieving the desired target costs at the product level (Cooper and Slagmulder, 1999). The third process is apportionment of target costs to each important element on bills of materials by combining estimated costs or historic records of costs and the constraint of the overall target cost (Cooper and Slagmulder, 1999; Ellram, 2006).

The TC system becomes especially effective when it is linked to form a chain (Cooper and Slagmulder, 2003b). The TC system is "chained" when the output of a buyer's TC system becomes an input to a supplier's target costing system, which is reflected in the transmission of competitive pressure faced by the firm at the top of the chain to other firms in the chain (Cooper and Slagmulder, 2003b).

## **4 The inhibiting factors**

This section addresses the third objective of the paper, which is identifying the inhibiting factors that might prevent the implementation in previous section reviewed costing approaches. Firstly is described the method used for the selection and analysis of relevant sources and it is then followed by the discussion of identified inhibitors.

## **4.1 Methodology**

In order to identify the inhibitors we have reviewed a number of academic publications focused on inter-organisational relationships, supply chain management and management accounting. We approached the review in the systematic way by following the guidelines of:

- Evidence-based structured review of the literature (Tranfield *et al.*, 2003) in the process of formulating search strategy and
- Iterative qualitative evaluation of publications as suggested by Miles and Huberman (1994) in the process of literature review and analysis.

The formulation of a search strategy consisted of selection of relevant databases, time frame and keywords. Databases included Pro-Quest, Ebsco, Emerald and Science Direct. This enabled access to a variety of peer reviewed journals ranging from Accounting, Organizations and Society, Harvard Business Review, Journal of Business Logistics and the Journal of Business and Industrial Marketing. In terms of the time frame we selected the literature published between 1980 and 2007 – the period where the great majority of publications on management accounting in inter-organizational relationships and supply chain management were published. The selection of the keywords associated with the word “inhibitor” was guided by the description of inhibitor by Assink (2006) where it is referred to as a “barrier” or something that get in the way of a given development. Words with similar meaning to inhibitor like inhibiting factors, barriers, impediments, issues and problems were then combined with other IOC related terminology to form search strings.

To ensure the relevance of identified literature we have firstly filtered search results on the basis of titles and abstracts. This has allowed filtering out the literature from non-related fields and topics that was included in initial search results due to data base and key-word search shortcomings. The remaining set of literature was subjected to an iterative qualitative evaluation (Miles and Huberman, 1994) consisted of three steps.

In the first step we determined criteria for inclusion in the research. A publication had a) to be empirical or theoretical b) to address the topic of management accounting in intra or inter-organisational context and c) to include debates on inhibitors or related terms, as defined by Assink (2006). On the basis of these criteria two of us evaluated publications to select the appropriate ones. The publication was included for further analysis only if both

researchers achieved agreement on inclusion. If consent about inclusion was not achieved, they sought advice from other authors. The final selection comprised 67 papers and five books.

The second step involved reviewing each publication in order to identify inhibitors and related discussions. The two lead researchers publications identified in step one, searching for evidence of inhibitors or inhibiting events. Fifteen theoretical and eighteen empirical papers contained discussions from which it was possible to extract the inhibitors, whereas the rest of the literature helped to substantiate our discussion. Both researchers created a summary report that consisted of description of inhibitors and/or inhibiting events. The content of the reports was then discussed between researchers and at the end the lead researchers summarised the findings in a single table.

While conducting the second step an early analysis was carried out. Miles and Huberman (1994) recommend early analysis because it helps researcher to “cycle back and forth between thinking about existing data and generating strategies for collecting new, often better data” (p. 50). The analysis showed that many inhibitors are intra-organisational in the nature and as such inhibit further inter-organisational costing developments. Thus, a search for new literature was conducted following the steps already described. That has resulted at the end in a total of eighteen theoretical (see Table I) and twenty-four empirical papers (see Table II).

**Table I: Phenomenon studied from theoretical sources**

Sources of theoretical evidences on IOC approaches and implementation concerns	
Phenomenon studied	Author(s)
<ul style="list-style-type: none"> <li>▪ Target costing in the context of supply chains</li> <li>▪ Target costing in the inter-organisational environment</li> <li>▪ ABC as a strategic costing method to manage business operations</li> <li>▪ ABC as a tool for determining cost for marketing and logistics activities</li> <li>▪ ABC as a tool for measuring supply chain costs, information integration issues</li> <li>▪ ABC as a costing method in the supply chain context</li> <li>▪ ABC – overview, design and implementation in an intra-organisational context</li> <li>▪ ABC/ABM as an approach to the management of staff activities</li> <li>▪ Cost-to-Serve Method and its applicability</li> <li>▪ Costing data and information integration in the supply chain context</li> <li>▪ Strategic cost management beyond the boundaries of the firm</li> <li>▪ Management accounting techniques for supply chain management</li> <li>▪ Supply chain costing methods and associated issues</li> <li>▪ Challenges for cost management practices in new enterprise environment</li> <li>▪ Disclosure of sensitive costing data in business relationships</li> <li>▪ Cost measuring and data sharing in supply chain context</li> <li>▪ Cost accounting and cost management in the network relationships</li> <li>▪ Management accounting and supply chain management</li> </ul>	<ul style="list-style-type: none"> <li>▪ Smith and Lockamy (2000)</li> <li>▪ Cooper and Slagmulder (2003a, 2003b)</li> <li>▪ Thomson and Gurowka (2005)</li> <li>▪ Stapleton <i>et al.</i> (2004)</li> <li>▪ Cokins (2000)</li> <li>▪ Lin <i>et al.</i> (2001)</li> <li>▪ Cokins (1998)</li> <li>▪ Armstrong (2002)</li> <li>▪ Braithwaite and Samakh (1998)</li> <li>▪ LaLonde (2003)</li> <li>▪ Cooper and Slagmulder (1998)</li> <li>▪ Ramos (2004) and Axelsson <i>et al.</i> (2002)</li> <li>▪ LaLonde and Pohlen (1996)</li> <li>▪ Gupta and Gunasekaran (2004)</li> <li>▪ Munday (1992)</li> <li>▪ Cokins (2003)</li> <li>▪ Kulmala <i>et al.</i> (2002)</li> <li>▪ Ramos (2004)</li> </ul>

**Table II: Phenomenon studied from empirical sources**

Sources of empirical evidences on IOC approaches and implementation concerns			
Phenomenon studied	Industry / Country	Methodology	Author(s)
ABC	<ul style="list-style-type: none"> <li>▪ Wholesaler textile / Singapore</li> <li>▪ Manufacturing equipment sector / Belgium</li> <li>▪ Cross sectoral: banking services, food industry, steel industry, third party logistics provider</li> </ul>	<ul style="list-style-type: none"> <li>▪ Case study</li> <li>▪ Case study</li> <li>▪ Multiple case studies</li> </ul>	<ul style="list-style-type: none"> <li>▪ Fernie <i>et al.</i> (2001)</li> <li>▪ Waeytens and Bruggeman (1994)</li> <li>▪ Kaplan and Anderson (2004)</li> </ul>
DPP	<ul style="list-style-type: none"> <li>▪ Retail supermarket chain / U.S.</li> <li>▪ Retail textile / UK</li> <li>▪ Wholesaler textile / Singapore</li> </ul>	<ul style="list-style-type: none"> <li>▪ Case study</li> <li>▪ Case study</li> <li>▪ Case study</li> </ul>	<ul style="list-style-type: none"> <li>▪ Borin and Farris (1990)</li> <li>▪ Doherty <i>et al.</i> (1993)</li> <li>▪ Fernie <i>et al.</i> (2001)</li> </ul>
CS	<ul style="list-style-type: none"> <li>▪ 3PL service delivery</li> <li>▪ Manufacturing industry</li> </ul>	<ul style="list-style-type: none"> <li>▪ Case study</li> <li>▪ Case study</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ross <i>et al.</i> (2007)</li> <li>▪ Gebert <i>et al.</i> (1996)</li> </ul>
TCO	<ul style="list-style-type: none"> <li>▪ Cross sectoral / U.S.: random sample</li> <li>▪ Cross sectoral / U.S.: public utility, IT manufacturing, hi-tech manufacturing, oil production, consumer and industrial products manufacturing (industries not randomly selected)</li> <li>▪ Cross sectoral / U.S.</li> <li>▪ Cross sectoral / U.S.: oil, semiconductor, semiconductor consortium, telecommunication equipment and support, transportation, defence/electronics, diversified electronics/computer, medical systems, defence/aviation, process industry</li> <li>▪ Manufacturing industry / U.S.</li> <li>▪ Cross sectoral, U.S.: heavy equipment manufacturing, semiconductors, consumer products, telecommunications, industrial air products and chemicals</li> </ul>	<ul style="list-style-type: none"> <li>▪ Survey/261 responses</li> <li>▪ Nine case studies</li>   <li>▪ Survey/sample N/A</li> <li>▪ Eleven case studies</li>   <li>▪ Survey/146 responses</li> <li>▪ Five case studies</li> </ul>	<ul style="list-style-type: none"> <li>▪ Zsidisin <i>et al.</i> (2003)</li> <li>▪ Ellram (1994)</li>   <li>▪ Milligan (1999)</li> <li>▪ Ellram and Siferd (1998)</li>   <li>▪ Ferrin and Plank (2002)</li> <li>▪ Ellram (2002b)</li> </ul>
TC	<ul style="list-style-type: none"> <li>▪ Construction sector / UK</li> <li>▪ Cross sectoral / U.S.: random sample</li> <li>▪ Cross sectoral / U.S.: heavy equipment manufacturing, semiconductors, consumer products, telecommunications, industrial air products and chemicals</li> <li>▪ Cross sectoral / U.S.: computer peripherals, semiconductors, manufacturing equipment, consumer products, electronic equipment, telecommunication service &amp; equipment, aerospace, transportation service, automotive</li> <li>▪ Cross sectoral / Netherlands: food, textile, publishing/paper, chemicals/pharmaceuticals, rubber, steel, fabricated metals, electrical/electronics, transportation equipment, precision equipment</li> </ul>	<ul style="list-style-type: none"> <li>▪ Two case studies</li> <li>▪ Survey/261 responses</li> <li>▪ Five case studies</li>   <li>▪ Eleven case studies</li>   <li>▪ Survey/32 responses</li> </ul>	<ul style="list-style-type: none"> <li>▪ Nicolini <i>et al.</i> (2000)</li> <li>▪ Zsidisin <i>et al.</i> (2003)</li> <li>▪ Ellram (2002b)</li>   <li>▪ Ellram (2002a)</li>   <li>▪ Dekker and Smidt (2003)</li> </ul>
Cost management development projects	<ul style="list-style-type: none"> <li>▪ Manufacturing sector / Finland</li> </ul>	<ul style="list-style-type: none"> <li>▪ Three case studies</li> </ul>	<ul style="list-style-type: none"> <li>▪ Kulmala (2004)</li> </ul>
Value chain analysis in inter-organisational context	<ul style="list-style-type: none"> <li>▪ Retailing sector / UK</li> </ul>	<ul style="list-style-type: none"> <li>▪ Case study</li> </ul>	<ul style="list-style-type: none"> <li>▪ Dekker (2003)</li> </ul>
Inter-organisational cost management systems	<ul style="list-style-type: none"> <li>▪ Manufacturing sector / Japan</li> </ul>	<ul style="list-style-type: none"> <li>▪ Case study</li> </ul>	<ul style="list-style-type: none"> <li>▪ Cooper and Yoshikawa (1994)</li> </ul>
Inter-organisational cost management practices	<ul style="list-style-type: none"> <li>▪ Manufacturing sector / Japan</li> </ul>	<ul style="list-style-type: none"> <li>▪ Three case studies</li> </ul>	<ul style="list-style-type: none"> <li>▪ Cooper and Slagmulder (2004)</li> </ul>
Inter-firm supply chains and cost management practices	<ul style="list-style-type: none"> <li>▪ Cross sectoral / U.S. and UK: manufacturing equipment, automotive, construction</li> </ul>	<ul style="list-style-type: none"> <li>▪ Three case studies</li> </ul>	<ul style="list-style-type: none"> <li>▪ Cullen <i>et al.</i> (1999)</li> </ul>
Inter-firm accounting in supply chains	<ul style="list-style-type: none"> <li>▪ Manufacturing equipment / UK</li> </ul>	<ul style="list-style-type: none"> <li>▪ Case study</li> </ul>	<ul style="list-style-type: none"> <li>▪ Seal <i>et al.</i> (2004)</li> </ul>
Costing knowledge in supply relationships	<ul style="list-style-type: none"> <li>▪ Cross sectoral / US: manufacturing, merchant retailers, third parties providers and services</li> </ul>	<ul style="list-style-type: none"> <li>▪ 24 case studies followed by survey (84 responses)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Norek and Pohlen (2001)</li> </ul>
Open book accounting in customer supplier relationships	<ul style="list-style-type: none"> <li>▪ Cross sectoral / Germany and Finland: automotive parts manufacturing, industrial products manufacturing</li> </ul>	<ul style="list-style-type: none"> <li>▪ Multiple case studies</li> </ul>	<ul style="list-style-type: none"> <li>▪ Kajüter and Kulmala (2005)</li> </ul>

Summary data from the literature were then analysed in the third step. The aim was to identify and extract the inhibiting factors from previously identified inhibiting events. Researchers firstly extracted inhibiting factors individually and then compared notes with the others. The aim was to achieve consent among researchers' interpretations on what is the inhibitor in a given event. If that was not achieved, advice was sought from other team members. The output of this process was a table with 42 different inhibitors and it is presented in the next section.

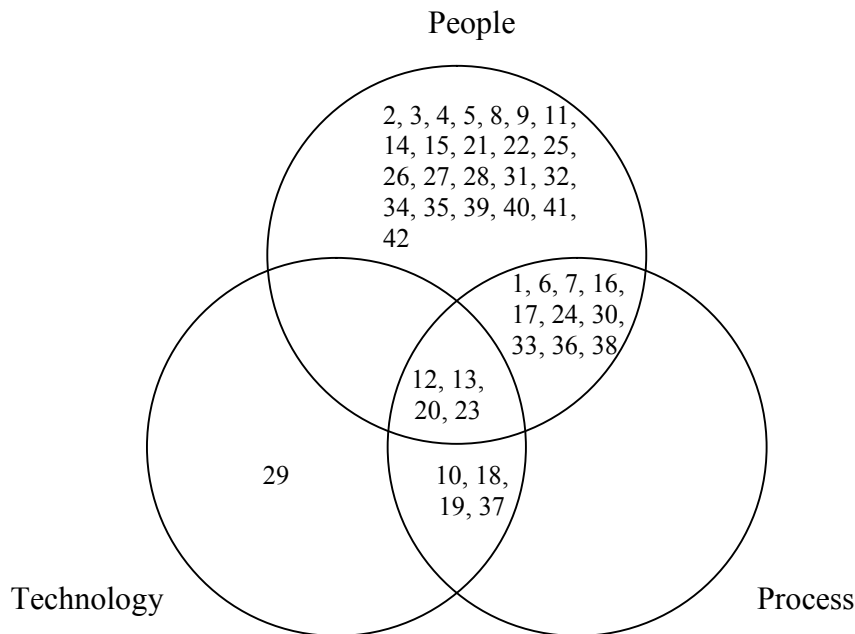
Inhibitors were then grouped in three overlapping categories. The objective of this paper is to identify and describe the inhibitors, rather than to come up with an explicit taxonomy. Categories were agreed between us on the basis of the most frequently specified enablers of inter-organisational integration initiatives, which are: IT system integration (Gunasekaran and Ngai, 2004), process integration (Bowersox *et al.*, 1999) and relational integration (Gummesson, 1999; Lambert *et al.*, 1998). Following the same process as in the previous step, we assigned each inhibitor to one or more proposed groups.

## **4.2 The inhibitors**

Here we present results of the literature analysis. In total 42 inhibitors were identified. They are listed in alphabetical order in Table III. These inhibitors are then grouped in categories and presented in Figure 2. Within each group inhibitors the most frequently specified are then explained in terms of how they inhibit implementation of IOC approaches.

**Table III: Inhibitors of the implementation of the IOC approaches**

#	Inhibitors	Author(s)
1	Absence of cross functional teams	Cullen <i>et al.</i> (1999); Ellram (2002a, 2002b), Ramos (2004)
2	Absence of expert knowledge to cost the activities	LaLonde and Pohlen (1996); Seal <i>et al.</i> (2004)
3	Absence of link between performance measurement systems and costs	LaLonde and Pohlen (1996); Thomson and Gurowka (2005)
4	Absence of management skills by management accountants	Cullen <i>et al.</i> (1999), Ramos (2004)
5	Absence of skills in managing IOC models	Cokins (1998)
6	Absence of supplier involvement	Ellram (2002a)
7	Absence of supply management people involvement	Ellram (2006)
8	Absence of the recognition that costing systems are necessary	Kulmala <i>et al.</i> (2002); Gupta and Gunasekaran (2004)
9	Adversarial character of business relationships	Cooper and Yoshikawa (1994); Nicolini <i>et al.</i> (2000)
10	Complicated tracing of resource costs	LaLonde and Pohlen (1996);
11	Conflict between management incentives and long-term perspective	Ferrin and Plank (2002)
12	Credibility of internal costing data	Milligan (1999); Ellram (2002b)
13	Credibility of reported numbers	Ellram (2002b)
14	Data manipulation and improper use of data	Ellram and Siferd (1998)
15	Disagreements on implementation approach	Kajüter and Kulmala (2005)
16	Idle time reporting in the IOC design phase	Cokins (2003)
17	Inability to determine market prices	Nicolini <i>et al.</i> (2000)
18	Inability of external information integration	LaLonde (2003); Ramos (2004)
19	Inability of internal information integration	Cokins (1998); LaLonde (2003)
20	Inability to change costing data collection / analysis for external sharing	Munday (1992); Nicolini <i>et al.</i> (2000)
21	Inconsistent use of costing language	Thomson and Gurowka (2005)
22	Information appropriation	Shank and Govindarajan (1988); Cooper and Yoshikawa (1994); Ellram and Siferd (1998); Axelsson <i>et al.</i> (2002); Ellram (2002b); Seal <i>et al.</i> (2004); Kajüter and Kulmala (2005)
23	Insufficient level of detail in shared financial data	Munday (1992)
24	Lack of differentiation of costing systems based on customers dynamics	Smith and Lockamy (2000)
25	Lack of focus on people	Cokins (1998)
26	Lack of internal interest for change in costing approaches	Axelsson <i>et al.</i> (2002)
27	Lack of internal understanding of costs	Cokins (2000); Nicolini <i>et al.</i> (2000); Norek and Pohlen (2001); Kulmala <i>et al.</i> (2002); Cokins (2003)
28	Lack of management support	Ellram (2002a); Ellram (2002b); Seal <i>et al.</i> (2004)
29	Lack of process oriented accounting systems	Ellram (1994); Cullen <i>et al.</i> (1999); Smith and Lockamy (2000); Ellram (2002b); Ramos (2004)
30	Lack of resources for complex cost tracing and relationship building	Borin and Farris (1990); LaLonde and Pohlen (1996); Milligan (1999); Nicolini <i>et al.</i> (2000); Stapleton <i>et al.</i> (2004); Kajüter and Kulmala (2005)
31	Lack of training and education of all costing information users	Ellram (2002b); Thomson and Gurowka (2005)
32	Legacy of functional silo and the absence of process thinking	Ellram (1994); Ellram and Siferd (1998); Fernie <i>et al.</i> (2001)
33	Loss of customer focus	Lin <i>et al.</i> (2001)
34	Low perception for IOC implementation and accountability for results	Cokins (2000); Zsidisin <i>et al.</i> (2003)
35	Need for development of new supply chain leaders	Ellram (1994); LaLonde (2003)
36	Over complex IOC systems	Cokins (1998); Kaplan and Anderson (2004)
37	Poor internal availability of data	Borin and Farris (1990); LaLonde and Pohlen (1996); Milligan (1999); Lin <i>et al.</i> (2001); Kulmala <i>et al.</i> (2002); LaLonde (2003); Kajüter and Kulmala (2005)
38	Poor IOC model design	Waeytens and Bruggeman (1994); Cokins (1998)
39	Slow response to change	Fernie <i>et al.</i> (2001)
40	Underestimation of organisational resistance to change	Ellram (1994); Cokins (1998); Ellram and Siferd (1998); Lin <i>et al.</i> (2001)
41	Uneven sharing of benefits	Kulmala (2004); Kajüter and Kulmala (2005); Cooper and Slagmulder (1998)
42	Unwillingness to share information two ways	Shank and Govindarajan (1988); Cooper and Yoshikawa (1994); LaLonde and Pohlen (1996); Norek and Pohlen (2001); Kulmala <i>et al.</i> (2002); Cooper and Slagmulder (2003); Kulmala (2004);

**Figure 2: Grouping of IOC implementation inhibitors**

#### 4.2.1 People-related inhibitors

The adversarial character of business relationships accompanied by the absence of trust and imbalance of power between organisations is a well known reality in many organizations. Cooper and Yoshikawa, (1994) and Nicolini *et al.*, (2000) argue that this aspect of inter-organizational relationships makes application of costing approaches particularly difficult. The difficulties arise from organizational reluctance to share sensitive cost information and concerns related to information appropriation.

The unwillingness of organisations to share cost information has two obvious consequences:

- a) It prevents accurate costing of activities outside the organisation (Lalonde and Pohlen, 1996),
- b) It leads to the loss of costing information transparency which is one of the prerequisites for establishing trust in business relationships (Lamming, 1993).



Information shared in one direction only may affect confidence in the buyer-supplier relationship (Norek and Pohlen, 2001) and result in a conditional openness in the relationship (Kulmala, 2004). The situations where disclosure of sensitive information is demanded and does not happen on a voluntarily basis is likely to be the environment where implementation of IOC programmes will experience problems.

Suppliers, as usually less powerful parties in business relationships, are somehow “expected” to disclose costing information to their buyers (Munday, 1992) and to comply with what the more powerful party is demanding (Norek and Pohlen, 2001). Further, suppliers often feel threatened that costing information will be used against them. Kajüter and Kulmala (2005) for example stress in their empirical study that information appropriation concerns are manifested in a fear of suppliers “being exploited if they reveal their cost structure”. Similarly, as corroborated in the study by Dekker (2003), information appropriation concerns triggered suppliers’ opportunistic behaviour in order to protect their position in the market.

Organisational resistance to change is an issue which is according to Ellram and Siferd (1998) grossly underestimated in the IOC implementation initiatives. They pointed out that resistance to change in initiatives that span organisational borders, represents a “dual challenge” because the change involves both buying and supplying organisations. Fernie *et al.* (2001) point out that slow response to change from the large and complex organisation represents a particular problem for successful implementation of costing systems. The implementation of IOC programmes between the focal organisation and its upstream or downstream partners requires a strong emphasis on the social dimension of the project (Cokins, 1998). IOC programmes are socio-technical projects which require not only successful technical implementation, but also changes in people’s behaviour. Resistance to change is natural: a *status quo* situation is often preferred (Cokins, 1998). This should not come as a surprise for IOC implementation teams. For instance, Ellram (1994) reports resistance to change as one of the main barriers in implementing TCO models in organisations. However, the degree of resistance depends in part on organisational culture and the complexity of IOC initiatives (Ellram and Siferd (1998) and it will vary from one organisation to another.

Lack of managerial support, described in the organisational change literature, is one of the most frequent reasons why transformation efforts in organisations fail (Kotter, 1995). Findings from our analysis indicate this issue to be a frequent inhibitor. Seal *et al.*'s (2004) empirical study on inter-firm accounting in supply chains shows that lack of management support partly hindered the efforts of institutionalization of inter-organisational accounting. The argument from the other perspective presented by Ellram (2002a, 2002b) is that involvement of management in implementation efforts provides “the knowledge, cooperation, and commitment needed to increase the likelihood that target costing will be successful within an organisation” (Ellram, 2002a, p.243).

The legacy of functional silo and the absence of process thinking in organisations are also recognised as being inhibitors for successful implementation of IOC programmes (Ellram, 1994; Ellram and Siferd, 1998; Fernie *et al.*, 2001). IOC approaches require a shift in thinking from functional silo to seamlessly integrated business processes. Retaining information about products, services, processes and costs within functions inhibits an organisation's responsiveness. Even organisations with excellent technology that support the process-oriented view find that deeply imbedded functional silo thinking prevents collaboration and sharing information internally – which further prevents the organisational responses to collaboration and sharing information externally.

Several inhibitors are grouped around the lack of understanding of costs and (non)possession of costing knowledge/expertise. Internal understanding of costs and possession of costing knowledge is seen as a prerequisite for successful implementation of IOC approaches (LaLonde and Pohlen, 1996; Cokins 2000, 2003; Norek and Pohlen, 2001). Cokins (2000) argues that only by having an internal understanding of how organisations create costs will they be able to begin discussions about opportunities for joint cost reduction.

The need for internal understanding of costs requires organisations to form expert, cross-functional teams from the beginning of a new IOC programme. LaLonde and Pohlen (1996) stress that the use of expert knowledge in the process of identifying activities performed by other organisations can help to solve the problems associated with costing activities that span organisational borders. Therefore, related inhibitors include the absence of expert knowledge (Seal *et al.*, 2004), the absence of management skills by management

accountants (Cullen *et al.*, 1999; Ramos, 2004), the absence of skills in managing IOC models (Cokins, 2000) and the lack of training and education for all cost information users (Ellram, 2002b; Thomson and Gurowka, 2004).

Lastly we found conflict between management incentives and a long-term perspective. Ferrin and Plank (2002) stress that costs in an organisation should be examined from a long-term perspective. The same view should be adopted for weighting between the potential benefits and costs associated with the implementation of IOC programmes. The resource-intensive nature of IOC programmes could negatively affect an organisation's short-term financial performance, departmental and organisational efficiency and/or utilisation of assets, among others. This, in spite of potential long term benefits of IOC implementation, represents a threat for the organisation's management which is often measured on a short-term basis.

#### **4.2.2 People-Process related inhibitors**

Here we analyse inhibitors related to "with whom" and "how" organisations approach to implementation of IOC programmes. The degree of difficulty of implementation vary among organisations for several reasons - such as differences in complexity of costing models, complexity of operations, resource availability and an organisation's cultural issues. The dispersion (Ellram, 1994), embedded functional knowledge in organisations and knowledge-intensive requirements of IOC implementations, call for the formation of cross-functional implementation teams (Cullen *et al.*, 1999; Ellram, 2002a, 2002b; Ramos, 2004). Formation of such teams should bridge organisational borders (Ramos, 2004). Based on the experience with implementation of target costing in U.S. manufacturing industry, Ellram (2002b) stresses that the whole process is most effectively undertaken if it involves cross-functional teams, including suppliers, from the start.

Further findings indicate that poorly designed and over-complex IOC models lead to implementation failure (Waeytens and Bruggeman, 1994; Cokins, 1998; Kaplan and Anderson, 2004). The experience in implementing ABC systems captured by Cokins (1998) shows that organisations need to be very precise and clear in the early model design phase when it comes to requirements for costing data accuracy and costing data details. Failure to achieve this will result in an over-complex costing model that contains

unnecessary data (Cokins 1998), unmaintainable quantity of data (Kaplan and Anderson, 2004) and data which are likely to be unsuitable for intra- and inter-organisational sharing.

Another inhibitor is an organisation's lack of resources to support the process of implementation of IOC programmes. Lack of resources is manifested in many different ways. Experience of implementation of TCO (Milligan, 1999), ABC (Stapleton *et al.*, 2004) and open book accounting (Kajüter and Kulmala, 2005) shows demanding, labour-intensive and costly implementation processes as a serious concern and limitation. Implementation efforts are not only constrained by a lack of resources which are internal to the organisation. Kajüter and Kulmala (2005) show in their research that lack of external resources can be equally problematic. In their study on adoption of open-book accounting in manufacturing industry, one of six key reasons of adoption failures lies in the supplier's lack of resources for supporting the development of accounting systems that can reasonably support open-book practices.

### **4.2.3 Technology related inhibitors**

According to Davenport *et al.* (2004), in the 1990's many organisations had started with the introduction of Enterprise Resource Planning (ERP) systems in order to deliver a common, organisation-wide information infrastructure for their employees. Although the adoption of ERP systems delivered substantial benefits for organisations, two major limitations of these systems are still present (Akkermans *et al.*, 2003): insufficient extended enterprise functionality and lack of functionality beyond managing transactions. Even newer products such as supply chain management systems (SCM), supplier relationship management systems (SRM), and customer relationship management systems (CRM) reside on the transactional layer provided by ERP systems although many vendors claim to have business process orientation (Chopra and Meindl, 2003).

The findings from the analysis suggest that current IT systems which are in place in organisations lack process orientation. In such organisations cannot adequately support the process-oriented nature of IOC programmes. Ellram (1994) stresses in her research on TCO models that a lack of appropriate information systems is the major resource-related problem to support TCO implementation initiatives. Smith and Lockamy (2000) state that successful adoption of supply chain management practices together with appropriate

costing systems will require the adoption of process and customer oriented information systems. This view is consistent with that of Ramos (2004) who argues that new accounting information systems should be specifically concerned with shared processes and activities in an inter-organisational context. The successful adoption of SCM practices together with appropriate costing systems requires the adoption of process- and customer-oriented information systems, which will enable firstly internal information integration and later external integration with upstream and downstream partners (Davenport *et al.*, 2004).

#### **4.2.4 Process-Technology related inhibitors**

The need for internal and external information integration, remains an unresolved issue and a key inhibiting factor for inter-organisational cost information sharing in many organisations (Cokins, 1998; LaLonde, 2003). The management and execution of supply chain business processes depends on accurate, forecast, and interchangeable information. Grubic *et al.* (forthcoming) stressed concerns relating to the of understanding of information flow that must support supply chain processes. In order to achieve inter-company business process integration, both physical system integration and application integration must be present (Rudberg *et al.*, 2002). Although there are some initiatives in resolving this issue, as with the enterprise application integration (EAI) presented in Möller (2005), complete IT system inter-operability is measured in years or even decades according to Davenport and Brooks (2004).

Prior to resolving integration-related issues the problem of availability of internal costing data should be addressed. For an organisation which has poor availability of costing data internally, it is practically impossible to share such data with external parties. Kulmala *et al.* (2002) state that even if there is a will for sharing information externally, “the ability to produce needed information is also necessary”. This particular problem can be observed quite early in organisational attempts to adopt IOC programmes. In their study on DPP as a decision support in the retail sector, Doherty *et al.* (1993) report the difficulties in obtaining required costing data or in some occasions its complete non-existence. LaLonde and Pohlen (1996) stress that some organisations may not have the capability to relate resource costs to a specific activity, and most of them have not even adopted costing approaches which would enable them to provide costing information at the activity level.

This means that they would be unable to satisfy either internal or external needs for costing information.

#### **4.2.5 People-Technology-Process related inhibitors**

Organisations often do not trust their internal costing data (Milligan, 1999; Ellram, 2002b; Cokins 2003). Credibility of data is an important factor for the overall success of implementation of IOC approaches (Ellram, 2002b), and if it is overlooked by organisations, it can have various negative consequences. Speculation about the validity of the basis for decision making is one example. Milligan (1999) illustrates an example of purchasing managers from organisations where TCO systems are in place who state, that their TCO systems are “vague, inaccurate or otherwise untrustworthy” (p. 22). Many organisations operate with “a resigned acceptance” (Cokins, 2003) that their internal costing data are of poor quality and do not reflect a realistic situation. Ellram (2002b) argues that low credibility of costing data is certainly not likely to lead to success of IOC approaches. Furthermore, management in organisations should keep in mind that costing information collected through the process of tracing resource costs for internal purposes may not always be suitable for sharing externally. This difference in the form and nature of costing information for internal and external sharing calls for a change in the way organisations collect and process costing data (Munday, 1992). Changes to internal cost collection policies should be accompanied by efforts to define a sufficient level of detail in costing data (Munday, 1992) and determination of collaborative costs (Nicolini *et al.*, 2000).

## **5 Conclusions**

Inter-organisational costing is an important topic for logistics and SCM. Both academics and practitioners have shown that decision making in a supply chain context is suboptimal without the relevant costing information. This can become even greater challenge in an inter-organisational context. We have demonstrated in our paper that traditional accounting practices do not fulfill their role supporting inter-organisational decisions. Contemporary accounting approaches overcome some of the shortcomings of traditional accounting practices. However, none of them is a panacea for all the problems that traditional accounting is facing in an inter-organisational context. An implementation of IOC

programmes can encompass one or more costing approaches, depending on the purpose of the implementation. While managers are facing new challenges in searching for more sustainable competitive advantage outside their organisations, they have little guidance on potential challenges related to adoption and implementation of IOC programmes.

Our analysis is the first systematic study that has uncovered the complexity of problems that hinder organisations in the process of implementing IOC programmes. As such it provides some answers for limited adoption of IOC approaches in intra- and inter-organisational context. The diversity of inhibiting factors suggests that we are indeed dealing with a complex inter-disciplinary phenomenon. This challenges a traditional preoccupation with the view that only IT and reduction of operational complexity are solutions for management of supply chain initiatives like implementation of IOC programmes. Human behaviour both inside and outside of a focal firm is reflected in many inhibitors identified in this study. We argue that implementation of IOC initiatives should not be seen as a technical implementation of something like an advanced IT system. It should rather be seen as a complex socio-technical process, which requires a strong emphasis on people internally and externally. We support authors like Nicolini *et al.* (2000), Norek and Pohlen (2001) and Rudberg *et al.* (2002) who argue that successful implementation of IOC programmes heavily depends on development of organisation's internal capabilities such as; knowledge and understanding of costs, allocation of human resources and internal information integration. Overcoming internal barriers is a necessary step prior to investment of efforts and resources in external activities.

Current frameworks for implementing IOC approaches, while they are talking about implementation steps (see for example Ellram, 2002a, Cooper and Slagmulder, 2003b), they are providing limited or no visibility of potential obstacles during the implementation process. In that sense the identification of inhibitors contribute to reduction of implementation risk, if it is used by managers as an informative document prior and during the implementation process. With some additional work by linking inhibitors identified in this study to a specific implementation step current IOC implementation frameworks can be greatly improved.

We set out to review both empirical and theoretical literature to explore inter-organisational costing approaches. We remain on the conceptual level and so we are

limited by the methodology used for selection and analysis of the literature. It is possible that selection of different sources could have resulted in difference in emphasis. We managed to reinforce the point made by Dekker (2003) that we need further research on obstacles hindering firms from (jointly) executing inter-organisational programmes. We have shown that the scope of the issues that surround the implementation of IOC approaches is much greater than it was imagined till now. The paper offers a starting point for more focused research that will address the issues surrounding a specific inhibitor. However, by taking a broad view of the presence of inhibitors, interdisciplinary empirical research is required to thoroughly understand the issues and offer a better guidance to managers.

## 6 References

Akkermans, H. A., Bogerd, P., Yucesan, E. and van Wassenhove, L.N. (2003), "The impact of ERP on supply chain management: Exploratory findings from European Delphi study", *European Journal of Operational Research*, Vol. 146 No. 20, pp. 284-301.

Armstrong, P. (2002), "The costs of activity-based management", *Accounting, Organizations and Society*, Vol. 27 No. 1/2, pp. 99-120.

Assink, M. (2006), "Inhibitors of disruptive innovation capability: a conceptual model", *European Journal of Innovation Management*, Vol. 9 No. 2, pp. 215-233.

Axelsson, B., Laage-Hellman, J., Nilsson, U. (2002), "Modern management accounting for modern purchasing", *European Journal of Purchasing & Supply Chain Management*, Vol. 8 No. 1, pp. 53-62.

Blocher, E.J., Chen, K.H., Cokins, G., Lin, T.W. (2005), *Cost Management: A Strategic Emphasis* (3rd ed.), McGraw-Hill/Irwin, New York, NY.

Bookbinder, J.H., Zarour, F.H. (2001), "Direct product profitability and retail shelf-space allocation models", *Journal of Business Logistics*, Vol. 22 No. 2, pp. 183-208.



Borin, N., Farris, P. (1990), "An Empirical Comparison of Direct Product Profit and Existing Measures of SKU Productivity", *Journal of Retailing*, Vol. 66 No. 3, pp. 297-314.

Bowersox, D., Closs, D.J., Stank, T.P. (1999), *21<sup>st</sup> Century Logistics: Making Supply Chain Integration a Reality*, Council of Logistics Management, Oak Brook, IL

Braithwaite, A. Samakh, E. (1998), "The Cost-to-Serve Method", *The International Journal of Logistics Management*, Vol. 9, No. 1, pp. 66-84.

Christopher, M. (1998), *Logistics and Supply Chain Management*, Financial Times, Prentice Hall, Great Britain.

Christopher, M. (2005), *Logistics and Supply Chain Management – Creating Value-Adding Networks*, (3rd edition), Financial Times, Prentice Hall, Great Britain

Chopra, S., Meindl, P. (2003), "What will drive the enterprise software shakeout?", *Supply Chain Management Review*, Vol. 7 January-February, pp. 50-57.

CIMA (2000), *Management accounting official terminology*, 2000 edition, CIMA, London

Cokins, G. (1998), "Why is Traditional Accounting Failing Managers?", *Hospital Material Management Quarterly*, Vol. 20 No. 2, pp. 72-80.

Cokins, G. (2000), "Measuring Costs Across the Supply Chain", *AACE International Transactions*, pp. 1-8.

Cokins, G. (2001), "Measuring Costs Across the Supply Chain", *Cost Engineering*, Vol. 43 No. 10, pp. 25-31.

Cokins, G. (2003), "Measuring profits and costs across the supply chain for collaboration", *Cost Management*, Vol. 17 No. 5, pp. 22-29.

Cooper, R., Slagmulder, R. (1998), "Strategic Cost Management", *Management Accounting*, Vol. 79 No. 9, pp. 19-20.

Cooper, R., Slagmulder, R. (1999), "Develop Profitable New Products with Target Costing", *Sloan Management Review*, Vol. 40 No. 4, pp. 23-33.

Cooper, R., Slagmulder, R. (2003a), "Interorganizational costing – Part 1", *Cost Management*, Vol. 17 No. 5, pp. 14-21.

Cooper, R., Slagmulder, R. (2003b), "Interorganizational costing – Part 2", *Cost Management*, Vol. 17 No. 6, pp. 12-24.

Cooper, R., Slagmulder, R. (2004), "Interorganizational cost management and relational context", *Accounting, Organizations and Society*, Vol. 29 No. 1, pp. 1-26.

Cooper, R., Yoshikawa, T. (1994), "Inter-organizational cost management systems: The case of the Tokyo-Yokohama-Kamakura supplier chain", *International Journal of Production Economics*, Vol. 37 No. 1, pp. 51-62.

Cullen, J., Berry, A.J., Seal, W., Dunlop, A., Ahmend, M., Marson, J. (1999), "Interfirm supply chains: the contribution of management accounting", *Management Accounting*, Vol. 77 No. 6, p. 30-32.

Davenport, T. H., Brooks, J. D. (2004), "Enterprise systems and the supply chain", *Journal of Enterprise Information Management*, Vol. 17 No. 1, pp. 8-19.

Davenport, T. H., Harris, J. G., Cantrell, S. (2004), "Enterprise systems and ongoing process change", *Business Process Management Journal*, Vol. 10 No. 1, pp. 16-26.

Dekker, H., Van Goor, A. R. (2000), "Supply Chain Management and Management Accounting: A Case Study of Activity-Based Costing", *International Journal of Logistics: Research and Applications*, Vol. 3 No. 1, pp. 41-52.

Dekker, H.C. (2003), "Value chain analysis in interfirm relationships: a field study", *Management Accounting Research*, Vol. 14, No. 1, pp. 1-23.

Dekker, H., Smidt, P. (2003), "A Survey of the adoption and use of target costing in Dutch firms", *International Journal of Production Economics*, Vol. 84 No. 3, pp. 293-305.

Doherty, C., Maier, J., Simkin, L. (1993), "DPP Decision Support in Retail Merchandising", *OMEGA, International Journal of Management Sciences*, Vol. 21 No. 1, pp. 25-33.

Dyer, J.H., Singh, H. (1998), "The Relational View: Cooperative Strategies and Sources of Interorganizational Competitive Advantage", *Academy of Management Review*, Vol. 23, No. 4, pp. 660-679.

Ellram, L.M. (1994), "A taxonomy of total cost of ownership models", *Journal of Business Logistics*, Vol. 15 No. 1, pp. 171-191.

Ellram, L.M. (2000), "Purchasing and Supply Management's Participation in the Target Costing Process", *Journal of Supply Chain Management*, Vol. 36 No. 2, pp. 39-51.

Ellram, L.M. (2002a), "Supply management's involvement in the target costing process", *European Journal of Purchasing & Supply Management*, Vol. 8 No. 4, pp. 235-244.

Ellram, L.M. (2002b), "Strategic Cost Management in the Supply Chain: A Purchasing and Supply Management Perspective" (pp. 16-18). *CAPS Research*.

Ellram, L.M. (2006), "The Implementation of Target Costing in the United States: Theory Versus Practice", *Journal of Supply Chain Management*, Vol. 42 No. 1, pp. 13-26.

Ellram, L.M., Hendrick, T.E. (1995), "Partnering Characteristics: A Dyadic Perspective", *Journal of Business Logistics*, Vol. 16 No. 1, pp. 41-64

Ellram, L.M., Siferd, S.P. (1993), "Purchasing: The cornerstone of the total cost of ownership model", *Journal of Business Logistics*, Vol. 14 No.1, pp. 163-184.

Ellram, L.M., Siferd, S.P. (1998), "Total cost of ownership: a key concept in strategic cost management decisions", *Journal of Business Logistics*, Vol. 19 No. 1, pp. 55-84.

Fernie, J., Freathy, P., Tan, E-L. (2001), "Logistics Costing Techniques and their Application to a Singaporean Wholesaler", *International Journal of Logistics: Research and Applications*, Vol. 4 No. 1, pp. 117-131.

Ferrin, B.G., Plank, R.E. (2002), "Total Cost of Ownership Models: An Exploratory Study", *Journal of Supply Chain Management*, Vol. 38 No. 3, pp. 18-29.

Gebert, P., Goldenberg, C. B., Peters, D. (1996), "Managing customers through cost-to-serve", *CMA*, Vol. 70 No. 7, pp. 22-23.

Grubic, T., Bastl, M., Fan, I-S., Harrison, A. (forthcoming), "Towards the Integrative Supply Chain Model", *International Journal of Logistics: Research and Application*

Gummesson, E. (1999) *Total Relationship Marketing*, Butterworth-Heinemann, Oxford

Gupta, K. M., Gunasekaran, A. (2004) "Costing in new enterprise environment - A challenge for managerial accounting researchers and practitioners", *Managerial Accounting Journal*, Vol 20 No 4, pp. 337-357

Gunasekaran, A., Ngai, E.W.T. (2004), "Information Systems in Supply Chain Integration and Management", *European Journal of Operational Research*, Vol. 159, No. 2, pp. 269-295.

Hakansson, H., Ford, D. (2002), "How should companies interact in business networks?", *Journal of Business Research*, Vol. 55, No. 2, pp. 133-139.

Hughes, A. (2005), "ABC/ABM – activity based costing and activity-based management - A Profitability model for SMEs manufacturing clothing and textiles in the UK", *Journal of Fashion Marketing and Management*, Vol. 9 No .1, pp. 8-19

Johnson, H.T., Kaplan R.S. (1987), *Relevance Lost: The Rise and Fall of Management Accounting*, Harvard Business School Press, Boston.

Kajüter, P., Kulmala, H.I. (2005), "Open-book accounting in networks – Potential achievements and reasons for failures", *Management Accounting Research*, Vol. 16 No. 2, pp. 179-204.

Kamppainen, K., Vepsäläinen, A.P.J. (2003), "Trends in industrial supply chains and networks", *International Journal of Physical Distribution & Logistics Management*, Vol. 33 No. 8, pp. 701-719.

Kaplan, R.S., Anderson, S.R. (2004), "Time-Driven Activity-Based Costing", *Harvard Business Review*, Vol. 82 No. 11, pp. 131-138.

Kotter, J.P. (1995), "Leading Change: Why Transformation Efforts Fail", *Harvard Business Review*, Vol. 73 No. 2, pp. 59-67.

Koulikoff-Souviron, M., Harrison, A (2007), "The pervasive human resource picture in interdependent supply relationships", *International Journal of Operations & Production Management*, Vol. 27 No. 1, pp. 8-27.

Kulmala, H. I. (2004), "Developing cost management in customer-supplier relationships: three case studies", *Journal of Purchasing & Supply Management*, Vol. 10 No. 2, pp. 65-77.

Kulmala, H.I., Paranko, J., Uusi-Rauva, E. (2002), "The role of cost management in network relationships", *International Journal of Production Economics*, Vol. 79 No. 1, pp. 33-43.

LaLonde, B. (2003), "Three Problems that Linger", *Supply Chain Management Review*, Vol. 7 No. 2, pp. 7-8.

LaLonde, B.J., Pohlen, T.L. (1996), "Issues in Supply Chain Costing", *The International Journal of Logistics Management*, Vol. 7 No. 1, pp. 1-11.

Lambert, D.M., Cooper, M.C. and Pagh, J.D. (1998), "Supply chain management, implementation issues and research opportunities", *International Journal of Logistics Management*, Vol. 9, No. 2, pp. 1-19.

Lamming, R.C. (1993), *Beyond Partnership – Strategies for Innovation and Lean Supply*, Prentice Hall, Harlow, UK

Lin, B., Collins, J., Du, R.K. (2001), "Supply chain costing: an activity-based perspective", *International Journal of Physical Distribution & Logistics Management*, Vol. 31 No. 9/10, pp. 702-713.

Mena, C., Aspinall, R., Bernon, M., Templar, S., Whicker, L. (2004), "Gaining visibility of supply-chain costs", *Logistics and Transport Focus*, Vol. 6 No. 7, pp. 54-57.

Milligan, B., (1999), "Tracking total cost of ownership proves elusive", *Purchasing*, Vol. 127 No. 3 pp. 22-23.

Miles B. M., Huberman, M. A. (1994), *Qualitative data analysis: an expanded sourcebook*, Sage Publications, Thousand Oaks, California.

Möller, C. (2005), "ERP II: a conceptual framework for next-generation enterprise systems?", *Journal of Enterprise Information Management*, Vol. 18 No. 4, pp. 483-497.

Munday, M. (1992), "Buyer-supplier partnerships and cost data disclosure", *Management Accounting*, Vol. 70 No. 6, pp. 28-29.

Myhr, N., Spekman, R.E. (2005), "Collaborative supply-chain partnerships built upon trust and electronically mediated exchange", *Journal of Business and Industrial Marketing*, Vol. 20 No. 4/5, pp. 179-187.

Nicolini, D., Tomkins, C., Holti, R., Oldman, A., Smalley, M. (2000), "Can Target Costing and Whole Life Costing be Applied in the Construction Industry?: Evidence from Two Case Studies", *British Journal of Management*, Vol. 11 No. 4, pp. 303-324

Norek, C.D., Pohlen, T.L. (2001), "Cost Knowledge: A Foundation for Improving Supply Chain Relationships", *International Journal of Logistics Management*, Vol. 12 No. 1, pp. 37-51.

Oliver, C. (1990), "Determinants of Interorganizational Relationships: Integration and Future Directions", *Academy of Management Review*, Vol. 15, No. 2, pp. 241-265.

Ramos, M.M. (2004) "Interaction between management accounting and supply chain management", *Supply Chain Management: An International Journal*, Vol 9 No 2, pp. 134-138

Ross, A., Jayaraman, V., Robinsons, P., (2007), "Optimising 3PL service delivery using a cost-to-serve and action research framework", *International Journal of Production Research*, Vol. 45, No. 1, pp. 83-101.

Rudberg, M., Klingenberg, N., Kronhamn, K. (2002), "Collaborative supply chain planning using electronic marketplaces", *Integrated Manufacturing Systems*, Vol. 13 No. 8, pp. 596-610.

Seal, W., Berry, A., Cullen, J. (2004), "Disembedding the supply chain: institutionalized reflexivity and inter-firm accounting", *Accounting, Organizations and Society*, Vol. 29 No. 1, pp. 73-92.

Seal, W., Cullen, J., Dunlop, A., Berry, T., Ahmet, M. (1999), "Enacting a European supply chain: a case study on the role of management accounting", *Management Accounting Research*, Vol. 10 No. 3, pp. 303-322.

Shank, J. K., Govindarajan, V. (1988), "The Perils of Cost Allocation Based on Production Volumes", *Accounting Horizons*, Vol. 2 No. 4, pp. 71-79.

Smith, W.I., Lockamy, A. (2000), "Target Costing for Supply Chain Management: An Economic Framework", *The Journal of Corporate Accounting & Finance*, Vol. 12 No. 1, pp. 67-77.

Stapleton, D., Pati, S., Beach, E., Julmanichoti, P. (2004), "Activity-based costing for logistics and marketing", *Business Process Management Journal*, Vol. 10 No. 5, pp. 584-597.

Stevens, G. C. (1989), "Integrating the Supply Chain", *International Journal of Physical Distribution & Materials Management*, Vol. 19 No. 8, pp. 3-8.

Templar, S. Bernon, M., Mingwei, F. (2004), "Supply Chain Costing – A Road Map", *Proceedings of Logistics Research Network Conference*, Dublin, pp. 510-516.

Terpend, R., Tyler, B.B., Krause, D.R. Handfield, R.B. (2008), "Buyer-Supplier Relationships: Derived Value Over Two Decades", *Journal of Supply Chain Management*, Vol. 44, No. 2; pp. 28-55

Thomson, J., Gurowka, J. (2005), "sorting out the clutter", *Strategic Finance*, Vol. 87 No. 2, pp. 27-33.

Tomkins, C. (2001), "Interdependencies, trust and information in relationships, alliances and network." *Accounting, Organizations and Society*, Vol. 26 No. 2, pp. 161-191.

Tranfield, D., Denyer, D., Smart, P. (2003), "Towards a Methodology for Developing Evidence-Informed Management Knowledge by Means of Systematic Review", *British Journal of Management*, Vol. 14 No. 3, pp. 207-222.



Zsidisin, G.A., Ellram, L.A., Ogden, J.A. (2003), "The Relationship between purchasing and supply management's perceived value and participation in strategic supplier cost management activities", *Journal of Business Logistics*, Vol. 24 No. 2, pp. 129-154.

Waeytens, D., Bruggeman, W. (1994), "Barriers to successful implementation of ABC for continuous improvement: A case study", *International Journal of Production Economics*, Vol. 36 No. 2, pp. 39-52.

Wouters, M., Anderson, J.C., Wynstra, F. (2005), "The adoption of total cost of ownership for sourcing decisions - a structural equations analysis", *Accounting, Organizations and Society*, Vol. 30 No. 2, pp. 167-191.

## **Authors as they appear in order on the paper**

### **Marko Bastl**

Centre for Logistics and Supply Chain Management, Cranfield School of Management, Cranfield, UK

E-mail: [marko.bastl@cranfield.ac.uk](mailto:marko.bastl@cranfield.ac.uk), Tel.: +44 1234 751122, Fax: +44 1234 751712, Centre for Logistics and Supply Chain Management, Cranfield School of Management, MK43 0AL Bedford, United Kingdom

Marko Bastl is a research fellow in Supply Chain Research Centre, Cranfield School of Management. His research interests are in business relationships development, supply chain process improvements, marketing-logistics interface and product-service systems. He is currently involved in the multi-disciplinary research on product-service systems; specifically he is a lead researcher on the project focused on supply network strategy for provision of product-service systems. Marko is currently in the last year of his doctorate, exploring the topic on relationship transparency. He authored and co-authored various papers in top international journals and conference proceedings. Prior he joined Cranfield School of Management he worked in manufacturing industry as head of finance, purchasing and as a freelance consultant.

### **Tonci Grubic**

Manufacturing Department, School of Applied Sciences, Cranfield University, Cranfield, UK

E-mail: [t.grubic@cranfield.ac.uk](mailto:t.grubic@cranfield.ac.uk), Tel +44 (0) 1234 750111 Ext 5264, Fax +44 (0) 1234 752159, Manufacturing Department, School of Applied Sciences, Cranfield University, Cranfield, Bedfordshire, MK43 0AL, UK

Tonci Grubic is a Research Fellow at Cranfield University, UK. He is currently working on a research project that aims to develop a model which will establish a value of delivering a Product-Service System for a machine tool builder. Before, he worked closely with automotive industry on a 2,5 years long logistics and supply chain management related research project. Prior to joining Cranfield University he was working at University of Split, Croatia, where he has earned MSc and BSc in Mechanical Engineering. His research interests include: logistics and supply chain management, operations management, information systems and supply chain modelling. He has authored or co-authored several papers in scientific journals and conference proceedings.

### **Simon Templar**

Centre for Logistics and Supply Chain Management, Cranfield School of Management, Cranfield, UK

E-mail: [simon.templar@cranfield.ac.uk](mailto:simon.templar@cranfield.ac.uk), Tel: +44 1234 751122, Fax: +44 1234 751712, Centre for Logistics and Supply Chain Management, Cranfield School of Management, MK43 0AL Bedford, United Kingdom

Simon Templar is a qualified accountant and a Teaching Fellow at the Centre for Logistics & Supply Chain Management, Currently his research interests are related to Supply Chain Costing. His current PhD research explores the impact of transfer pricing on supply chain management decisions. His paper 'Ensuring the Transfer Price is Right' has been included in the International Federation of Accountants Articles of Merit Award Program for Distinguished Contribution to Management Accounting in 2005. Simon has over 20 years experience in industry, ranging from 'bananas to telecommunications' in a wide range of management roles, including finance, sales and marketing, physical distribution management and human resource management.

**Alan Harrison MA MSc (Oxon) PhD CEng FIET**

Centre for Logistics and Supply Chain Management, Cranfield School of Management, Cranfield, UK

E-mail: [a.harrison@cranfield.ac.uk](mailto:a.harrison@cranfield.ac.uk), Tel: +44 1234 754839, Fax: +44 1234 751712, Centre for Logistics and Supply Chain Management, Cranfield School of Management, MK43 0AL Bedford, United Kingdom

Alan Harrison is professor of operations and logistics at Cranfield School of Management. After graduating in chemistry at Oxford University, he followed a career in manufacturing industry with Procter and Gamble, BL and GEC. Having seen the light & been converted to academic life, he joined Warwick Business School in 1986 as a senior research fellow studying the application of Japanese management methods in UK manufacturing. He completed his doctorate in enablers and inhibitors to material flow at Cranfield School of Management, which he joined in 1996. As Director of Research, he acts as Academic Leader for the School's Demand Chain Management Community, and was recently appointed Director of the Cranfield Executive Doctorate programme. He is author of *Just in Time Manufacturing in Perspective* (Prentice Hall, 1992), and joint author of *Operations Management*, 2nd edition, Pitman (1998) and of *Logistics Management and Strategy* 3<sup>rd</sup> edition, Pearson Education (2008).

Alan has led a number of large-scale research projects in several sectors, including automotive, aerospace and grocery. One example is the long-running ECR-Europe 'Stock Loss' project, which identified and helped correct sources of loss in the supply chain, involving collaborative work between manufacturers and retailers. Another is his research into customer responsive supply chains, focusing on the development of supply capabilities needed to meet demand variability and uncertainty.

**Ip Shing FAN BSc., PhD., CEng, MIEE, Mem SME**

Manufacturing Department, School of Applied Sciences, Cranfield University, Cranfield, UK

E-mail: [i.s.fan@cranfield.ac.uk](mailto:i.s.fan@cranfield.ac.uk), Tel +44 (0) 1234 750111 Ext 5651, Fax +44 (0) 1234 752159, Manufacturing Department, School of Applied Sciences, Cranfield University, Cranfield, Bedfordshire, MK43 0AL, UK

Dr Ip-Shing Fan is currently the Course Director of the MSc in Enterprise System Implementation in Cranfield University, UK. He has interest in the effective design, development, implementation and use of ICT in business and non-business organisations. His work included the use of business process modelling and analysis to help business to improve performance through smarter way of working. The improvement approach integrates the use of organisation and technology introduction with sensitive people change management. He has deliver consultancy to global businesses to help in different stages of ERP, PLM and SCM implementation. Using a socio-technical approach, he developed tools to provide organisation and human factor readiness assessment for enterprise systems; and assist in formulating change management plans to improve the readiness.