Adoption of E-Commerce in the Value Chain by SMEs

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INTRODUCTION

This article describes an analytical framework to identify the triggers for value chain transformation that will encourage small and medium enterprises (SMEs) to adopt e-commerce. The framework was adopted in the KITS project as part of a qualitative approach, using multiple case studies of SMEs that were involved in business-to-business (B2B) e-commerce (Jeffcoate, Chappell & Feindt, 2004). Results from this project are used to illustrate the use of the framework.

According to Yin (1994), one of the areas in which case research is most useful is the relationship between information technology and corporate strategy—precisely the area that is crucial to the development of e-commerce. Earlier researchers also adopted multiple cases for studies of SMEs in e-commerce or related areas. For example, Poon and Swatman (1997) studied 23 small businesses in Australia that were active Internet users in order to establish the pre-conditions for success and the strategic effects from its use. Other researchers in this area have relied on much smaller numbers of case studies, typically fewer than 10. Iacovou, Benbasat and Dexter (1995) carried out interviews on the adoption of electronic data interchange (EDI) with the managers of seven SMEs that were suppliers to the British Columbia government. Another study of the effect of EDI on a sample of eight small businesses in the UK (Chen & Williams, 1998) was based on in-depth interviews with key personnel.

BACKGROUND: THE KITS PROJECT

Knowledge Information Transfer Systems (KITS) was designed as a support action for SMEs in Europe and funded by the European Commission. It included a research programme whose aim was to analyse the activities of SMEs engaged in industry value chain relationships with suppliers and customers in order to establish best practice. An SME in this context is a company that employs fewer than 250 people. The research programme for KITS included two main work packages: the first looked at individual companies, whilst the second looked at evaluation across the value chain. This article, which is based on the first of these packages, describes the analytical framework that was adopted by this project.

The KITS sample consisted of 43 European SMEs that were actively involved in B2B e-commerce across industry and country boundaries (Table 1). The research focussed primarily on traditional SMEs with some level of automation, with a secondary focus on e-commerce start-ups (the 'dot.coms'). The interview programme was car-

Table 1. Companies by sector and country

	Manufacturing	Transport and logistics	Retail/wholesale	Business services	Total
Germany	7	3	1	3	14
Austria		1			1
Switzerland				1	1
Belgium			1		1
Italy	12	1	1		14
Sweden	1				1
UK	5	1	3	2	11
Total	**25**	**6**	**6**	**6**	**43**

ried out between September 2000 and January 2001. All of the respondents had board-level responsibility. They varied from managing directors in the smaller companies to IT, operations, and marketing directors in the larger organisations. It was felt that, in an SME, only one point of view is necessary, providing it is at a high enough level within the organisation.

The interviews were conducted using a semi-structured questionnaire that included both open and closed questions. The initial conceptual framework was adapted from one proposed by Ward and Griffiths (1996) for determining the strategic potential of information systems and establishing priorities for investment. Their framework takes a structured analytical route through the upper levels of the organisation. It is closely linked to the industry value chain, as well as to the organisational value chain, and was thus particularly appropriate for KITS. The following topics were covered: company background; strategy, objectives, and critical success factors; value chain partnerships and activities; and use of technology.

THE ANALYTICAL FRAMEWORK

The framework adopted for the analysis of the KITS case studies draws on key concepts proposed by a number of authors. It consists of the following elements:

- Type of industry value chain
- Stability of position within industry value chain
- Level of penetration of electronic links with customers and suppliers
- Complexity of automation of the internal IT environment
- Key value activities and interactions between value activities
- Complexity of automation of value activity interactions
- Level of achievable impact on the industry value chain

These elements are discussed in turn in the following sections, with illustrations from the KITS project.

CURRENT POSITION: THE SME IN THE VALUE CHAIN

A key element in the process by which SMEs adopt e-commerce is through the automation of the value chain, defined by Porter (1984) as a collection of activities that are performed by a company to design, produce, market, deliver, and support its product. Other authors refer to this as the internal value chain of a company, or organisational value chain, in contrast to the industry value chain. The latter consists of the organisational value chain, together with the value chains of the organisation's competitors, suppliers, and customers. It represents the movement of goods and services from the source of raw materials through to the final customer (Benjamin & Wigand, 1995).

Porter identified nine value activities, the physically and technologically distinct activities that the company performs and which add value to a product or service. More recently Chu (1995) defined critical value activities as those activities that an organisation must execute satisfactorily to ensure successful performance.

Type of Value Chain

An SME's perception of its value chain is important because it influences the company's strategy and therefore its e-commerce strategy. Companies can be classified as participating in one of four types of industry value chain defined by Baldock (1999):

- *Customer-Centric Value Chain:* The seller tailors its products to meet fast-changing consumer needs.
- *Seller-Driven Value Chain:* The seller presumes toknow what the market might want to buy.
- *Buyer-Driven Value Chain:* The customer states what he or she wants and sets out the terms and conditions that the supplier should meet.
- *Fragmented Value Chain:* Neither the buyer nor the seller business model dominates.

The majority of the KITS SMEs, who were in customer-centric value chains, believed that they should become more customer focused to meet the needs of such a value chain. They wanted to understand customers' needs better and more quickly, and, if possible, be proactive in meeting them.

Stability of Position within Value Chain

SMEs have upstream and downstream links with their business partners in the industry value chain. The strength, intensity, and permanence of these links are important in determining how deeply these SMEs are embedded in their networks (Yli-Renko & Autio, 1998). The majority of the KITS SMEs reported stable relationships with customers that had lasted for a number of years. They supported similarly stable relationships with suppliers, to whom they were highly loyal. However, they typically had far fewer suppliers than customers.