



Migrating from products to solutions: An exploration of system support in the UK defense industry

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ABSTRACT

This article explores the acquisition of business solutions in complex systems environments, through insights drawn from current literature and a study of the UK defense industry. We seek to counter-balance the dominance of literature focusing on the supplier perspective, as well as provide richer distinctions between different kinds of system suppliers involved in providing business solutions. We do this through the detailed examination of customer support offerings and business relationships that exist at the system customer–supplier interface. Our findings provide a map of solutions models that exist in the UK defense context. These include: (1) product system support, (2) life cycle product system support, (3) functional system support, and (4) enterprise system support. Using these models, we highlight the continued relevance of a product orientation and the challenges involved in adopting a true customer orientation when delivering business solutions. System suppliers seeking to reposition from the supply of product system support towards more integrated and customer-oriented forms of support require a significant organizational step change.

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1. Introduction

This article focuses on the acquisition of business solutions in complex systems environments. This includes aerospace, healthcare, telecommunications and defense industries, which are typically characterized as being high cost, large-scale and knowledge intensive. We specifically focus on large *industrial system customers*; examples include government run organizations such as the UK National Health Service or US Department of Defense or large private sector firms such as the British Airports Authority that are typically subject to government controls/regulations. Within specific industries, particularly at a national level, system customers dominate in their markets and are relatively few in number. Such organizations are responsible for integrating and managing a complex set of technical systems (i.e. railways, trains, infrastructure, IT, etc.) that form a fundamental part of the system customer's ability to deliver its core services (Mayntz & Hughes, 1988).

However, due to pressures such as the increasing complexity of technology, obsolescence and tighter budget constraints, many system customers are increasingly contracting for external 'support' to help them with their technical systems business, which in turn allows them to focus more on the provision of their core services. As opposed to traditional outsourcing, these system customers seek to work more effectively with their external partners/suppliers to (i) improve the organization of the customer's industrial activities, which technical systems are a part of, and (ii) improve the utility and/or performance of

its core services to end users/final consumers (Geyer & Davies, 2000; Kelley & Hurst, 2006; Pew & Mavor, 2007).

To achieve this, system customers are transforming *business relationships* with system suppliers and are also seeking more advance forms of customer system *support offerings*, which go beyond the traditional transactional delivery of technical systems and often costly bolt-on support services to supply ongoing material/expertise. Through the detailed examination of *support offerings* and *business relationships* at the system customer–supplier interface, this article seeks to offer clearer distinctions for those involved in study or practice of buying/selling business solutions. We do this through the detailed examination of one particular complex environment, the UK defense industry. The article is divided up into six main sections. Firstly, *Section 2* provides a review of relevant literature. *Section 3* provides a brief explanation of the motivation behind the research as well as the methodology adopted. *Section 4* provides a background to the UK defense industry, which leads into an exploration of key results. *Section 5* then reviews key findings, and presents managerial implications. *Section 6* provides the article's conclusion.

2. Literature review

Two emerging bodies of literature, not easily separated, appear to provide some explanatory power concerning the changing interface between the system customer and system supplier. The first relates to the 'migration from products to solutions' and the second is the 'management of solutions'. Tuli, Kohli, and Bharadwaj (2007) argue that current academic research predominantly views a solution as a 'customized and integrated combination of goods and services for meeting a customer's business needs'.

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Table 1
Separation of solutions literature.

Migration from product to solutions	Management and integration of solutions
<ul style="list-style-type: none"> • Service dominated logic (Vargo and Lusch, 2004) • Servitization (Vandermerwe and Rada, 1988) • Strategy and transformation (Bennett et al., 2001; Cornet et al., 2000; Shah et al., 2006) • Downstream value migration (Oliva and Kallenberg, 2003; Wise and Baumgartner, 1999) 	<ul style="list-style-type: none"> • Modularizing and repeating solutions (Foote et al., 2001; Davies et al., 2006) • Firm capabilities for solutions provision (Davies and Brady, 2000, Davies, Brady, & Hobday, 2007) • Solutions provision and network relationships (Windahl and Lakemond, 2006)

Table 1 is not meant to be exhaustive and we recognize that there is often considerable overlap in the two literature bases, yet it provides some clarity where there is an increasing level of complexity in the literature. Many key contributions typically begin by exploring issues related to transition and summarize with implications for succeeding in the solutions environment. Examples include profiting from standardizing the back-end supplier organization of solutions provision, and offering customer network based value propositions (Davies, Brady, & Hobday, 2006; Cova & Salle, 2008). We adopt a similar approach in this article, with emphasis on the acquisition of solutions from the system customer's view.

Despite recent progress, the business solutions landscape remains a difficult area to map, particularly based on the notion that it does not conform to what is understood about either product or service traditions (Baveja, Gilbert, & Ledingham, 2004; Galbraith, 2002; Krishnamurthy, Johansson, & Schlißberg, 2003; Nambisan, 2001). In this context, we examine literature and practice relevant to assisting researchers and practitioners to improve the mapping and characterization of business solutions in complex environments. In particular, we focus on two critical dimensions at the interface between system customers and their external system suppliers, namely (1) support offerings, and (2) business relationships.

'Support offerings' have been examined primarily from the perspective and experiences of suppliers, rather than customers. The case for suppliers to concentrate less on the manufacture of stand-alone physical products and more on providing high-value services and customer-focused solutions has been well emphasized in strategy and practitioner literatures (Bennett, Sharma, & Tipping, 2001; Cornet et al., 2000; Foote, Galbraith, Hope, & Miller, 2001; Johansson, Krishnamurthy, & Schlißberg, 2003; Quinn, 1992; Slywotzky & Morrison, 1998). In the context of moving downstream towards the customer there are a number of different customer system support strategies being adopted. Allmendinger and Lombreglia (2005) suggest that the 'embedded innovator' approach is the most product-oriented of so-called 'smart services'; these offerings are equipped and operated in a more intelligent manner (typically incorporating IT), feeding back data to R&D and pre-empting problems over time. The article's 'solutionist' innovator will attempt to offer complete or near to complete life cycle offerings for a single product line. An example presented in their paper is that of an MRI scanner, whereby the manufacturer undertakes almost all lifecycle activities, from design, build, customer training and maintenance. Activities beyond the manufacturer include 'scanning the patient' and 'interpreting the scan', which are core areas of the system customer. Offerings such as new aircraft, sea vessels and communications networks, typically have long development times and considerably longer in-service periods. System suppliers have been working with their customers to address the challenge of life cycle management, in other words dealing with issues such as obsolescence, long-term reliability, efficiency, and interoperability (Davies et al., 2001; Ivory, Thwaites, & Vaughan, 2003; Ward & Graves, 2006; Wucherer, 2006). Such suppliers have been 'moving base' from the provision of manufacturing and traditional support services, towards taking on activities normally carried out by their customers (Davies, 2004; Oliva & Kallenberg, 2003;

Wise & Baumgartner, 1999). However, in contrast to firms with a so-called 'installed base' (product system) that are making inroads downstream, service oriented suppliers, such as Cable & Wireless and WS Atkins were found to be moving 'upstream', building on their systems integration ability to 'design, specify and install' equipment supplied from multiple vendors (Davies, 2004). Sawhney (2004) describes 'marketing integration' as the intent to integrate all steps involved in the acquisition cycle, from initial customer need, to 'searching, evaluating, buying, installing, using, servicing and maintaining a system of products'.

The customer perspective of support offerings has received much less attention; however we identify some key articles in the industrial marketing literature. Cova and Salle (2007, p. 142) point out "the transition from a product orientation to a solution orientation whether it be called customer-focused integrated solutions (Davies et al., 2001) or customer centric company (Galbraith, 2005) requires a real reorganization around the customer." In this effort, Helander and Möller (2007) focus on the system supplier's *customer strategy* (value proposition, activities), which is examined in the overall context of positioning against (a) the customer's strategy and knowledge base, (b) status or phase of the customer-supplier relationship and (c) phase of underlying technology cycle. They argue that the supplier must develop an in-depth understanding of the customer's capabilities and expectations and in doing so will more appropriately identify its own contribution in terms of offerings and roles. Tuli et al. (2007) also argue that solution effectiveness is not just down to how the supplier configures the solution and its organization; it is also dependent on 'customer variables'. These include (i) the extent of 'customer adaptiveness' to the suppliers offering, (ii) 'political counseling' or how things work in the customer organization, and (iii) providing 'operational counseling' to suppliers, which includes sharing data and learning about the customers' operations.

Research on 'business relationships' provides useful insights for the acquisition of business solutions in complex environments. It is possible to position business relationships along a continuum spanning from transactional to collaborative (relational) exchange (Dwyer, Schurr, & Oh, 1987; Jackson, 1985; Penttinen & Palmer, 2007). With an increasing focus on (a) the operational performance of industrial customers, (b) the reliance on fewer suppliers to integrate systems, and (c) delivering joined-up inputs in the acquisition process, the need for higher quality customer-supplier relationships has been identified (Helander & Möller, 2007; Kowalkowski, 2005; Lindgreen, Palmer, Vanhamme, & Wouters, 2006; Ploetner & Ehret, 2006). Tuli et al. (2007) point out that the current interpretation of solutions in the literature is predominantly derived from a supplier dominated perspective, failing to consider whether customers actually share their interpretation. The authors propose a customer-based 'process-centric' view. Their data suggests customers perceive a solution as a set of customer-supplier relational processes comprising (1) customer requirements definition, (2) customization and integration of goods and/or services and (3) their deployment, and (4) post-deployment customer support.

In summary, system customers make ongoing decisions about the extent of integration that is required for individual acquisitions in the context of a complex environment and a wider network of activities. Factors such as extent of competition in the market, the stages of development (manufacture versus operation) in a system's life cycle or the rate of technological change may be determinants of customer-supplier relationship integration. The definition and forms of relationship integration that exist in complex systems environments as well as associated organizational implications (i.e. ownership integration, technical knowledge integration, etc.) are developing areas of research, which would benefit from further empirical studies (Araujo, Dubois, & Gadde, 2003; Brusoni, Principe, & Pavitt, 2001; Jaspers & van den Ende, 2006). Cova and Salle (2007) in their interpretation of *solutions marketing* and *project marketing* appear to articulate the arguably extreme position of a highly integrated supply relationship with the customer, through the following characteristics: "no pre-fixed offer, no demand systematically

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