

Governance mechanisms and relationship productivity in vertical coordination for new product development

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Abstract

This article explores the theoretical explanations of governance mechanisms in vertical coordination between firms over the product life cycle stages with reference to the high-technology industry. Firms in the high-tech industry face uncertainties of fast-changing environments such as rapid technological innovations and shortening product life cycles. Drawing on transaction cost analysis in vertical coordination, conditions under which transactional inefficiencies may arise are analyzed on different stages of product life cycle theory. Theoretical analysis suggests that interaction patterns over a product life cycle produce differing implications for achieving cost minimization and value maximization. The implications of this variation in transaction cost inefficiencies suggest that there are different opportunities for enhancing efficiencies or for creating value at different stages of the product life cycle. The article proposes that by considering the impact of exogenous factors on the stage of a product life cycle and relationship productivity, high-tech firms operating in volatile markets can safeguard their exposure to transactional inefficiencies.

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1. Introduction

In today's network economy, firms are confronted with rapid technological changes and global competition. A formative idea in marketing is that interfirm relations in marketing channels have gradually moved from transaction-oriented marketing (e.g. Williamson, 1979) and relationship management (e.g. Heide, 1994) to emphasize on coordination between networks of firms (Achrol and Kotler, 1999). In particular, suppliers of high-tech products often face technological skepticism frequently exhibited by buyers who delay or postpone their purchase of the product (Shanklin and Ryann, 1987) as well as obsolescence and the threat of competing technologies (Moriarty and Kosnik, 1989). It is therefore not surprising that the productivity of purchasing ties is particularly significant for vertical

coordination between firms in new product development relationships.

In vertical coordination, buyers and sellers engage each other in ways that are more intense than simple exchanges of products for payments (Clemons et al., 1993). This is pertinent in the relationship quality of new product development (NPD). Relationship quality has been defined as a concept that includes conflict, trust, commitment and the partner's willingness to invest in the relationship and expectation of continuity (Kumar et al., 1995). High quality relationships would have greater trust, commitment, willingness to invest, expectation of relationship continuity and lower levels of conflict. Consequently, researchers in marketing have taken an interest in the concept for the development and management of long-term relationships such as alliances and partnerships (e.g. Anderson and Weitz, 1989, 1992; Anderson and Narus, 1990; Dywer et al., 1987; Heide and John, 1990).

While there are models and frameworks for understanding working relationships between firms in business markets, there is little research in governance mechanisms

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of vertically connected NPD ties in volatile or high-tech industries that often have a direct impact on a product life cycle as well as the bottom line of buyers and sellers. This impact is significant to the quality of the relationship due to the complex nature and volatility of high-tech markets that contribute to a high perceived risk both on the supply and the demand side (Beard and Easingwood, 1992). An understanding of the implications of a product life cycle for governance mechanisms can help firms add value and satisfy partners' requirements and circumstances in vertical coordination for new product development. It is not surprising that firms in high-tech industries often engage in outsourcing to develop fewer but closer value-adding ties (Clemons et al., 1993; Wilson, 1994).

However, high-tech products have a short product life cycle that can make relationship investments uneconomical in vertical coordination. Participants of NPD in high-tech markets are often confronted with high switching costs as a result of commitments they have made in a certain technology or a particular vendor (see e.g. Jackson, 1985; Wilson, 1994; Heide and Weiss, 1995). The high volatility of high-tech markets adds to the difficulty in determining the relationship productivity between partners. Firms in the high-tech industry operate in a dynamic environment in which semiconductor production can increase the price/performance ratio of microprocessor-based computer systems by 10 times every two and a half years. This gives rise to discontinuous innovation and shortening product life cycles and hence businesses are forced to adopt dynamic paradigms such as competing and collaborating with competitors (Bengtsson and Kock, 2000) and inviting suppliers rather than recruit. Also, high-tech firms engage in a variety of network forms such as vertical networks that are dynamic and knowledge-rich, which have implications for generating innovations (Eng, 2004a).

The purpose of this article is to explore the governance mechanisms for vertical coordination between firms in NPD. In doing so, research propositions are developed in relation to understanding the productivity of relationship for different stages of product life cycle theory. Although there are many studies on different approaches of relationship governance in channel management (e.g. Anderson and Narus, 1984; Gundlach et al., 1995; Andaleeb, 1996), no particular conceptualization has yet been developed for explaining the forms of vertical coordination in a product life cycle of firms operating in high-tech markets. Thus, this article attempts to fill this gap in marketing literature and NPD.

2. Governance and vertical coordination

Following Palay's (1984, p. 265) definition, governance is defined as the institutional framework in which contracts are initiated, negotiated, monitored, adapted and terminated. It encompasses the initiation, termination and ongoing

relationship maintenance between a set of parties. Since the theoretical backdrop to vertical coordination is in the transaction cost analysis (TCA) tradition (Heide, 1994), governance is viewed as mechanisms designed for supporting economic transactions. Specifically, governance is considered with respect to mechanisms for achieving efficiency over the product life cycle in new product development.

Transaction cost analysis examines the issue of economic exchange as a problem of designing efficient relationships and mechanisms of adaptation to regulate that exchange. The focus is on minimization of production, organization and transaction costs (Williamson, 1979, 1985, 1991, 1993; Alchian and Woodward, 1988). The potential of numerous firms that could take part in NPD process renders ineffective coordination of marketing activities between independent manufacturers and distributors based on arms-length market relationships (Stern and El-Ansary, 1990). Thus, more effective coordination can be achieved through vertically integrated coordination, though that governance mode may be costly and inflexible (Anderson and Weitz, 1986).

Transaction costs include *ex ante* and *ex post* costs. The former include the out-of-pocket costs of negotiating contracts ('ink' costs), as well as the opportunity cost of forgone transactions. In NPD, *ex post* transaction costs in vertical coordination focus on minimizing costs related to product design changes, production planning and the like (Frazier et al., 1988). These *ex post* transaction costs can include: the costs of haggling, documentation, renegotiating margins and costs associated with the new activities being contemplated (Buvik and John, 2000). It is particularly relevant for NPD activities, in that the relationship productivity between partners would be expected to increase over time on the stages of the product life cycle. Interestingly, most studies have not yet considered the effects of vertical coordination in terms of productive allocation of resources over the stages of product life cycle.

Much of past empirical research on TCA has been applied to supply chains and strategic partnerships with a focus on cooperative interfirm ties. This form of partnership requires integration that entails the process of adaptation to eliminate inefficiencies. Since it is not possible to foresee the types of adaptations required in the relationship, TCA has been expanded to incomplete contracting literature (e.g. Grossman and Hart, 1986). It is assumed that firms economize on their limited information processing capabilities (Cyert and March, 1963), which provide a mechanism for coping with unforeseen contingencies and adapting to profitable revisions. The difficulty of specifying a complete contract is particularly pertinent in NPD activities.

The presence of incomplete contracts can only work within supportive governance structures such as in vertically coordinated interaction patterns. Vertical coordination was first elaborated in marketing by Stern and Reve (1980) in their political economy framework and later

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