

Chapter 16

Drivers of Organizational Participation in XML-Based Industry Standardization Efforts

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ABSTRACT

XML-based vertical standards are an emerging compatibility standard for describing business processes and data formats in specific industries that have emerged in the past decade. Vertical standards, typically implemented using eXtensible Markup Language (XML), are incomplete products in constant evolution, continually adding functionality to reflect changing business needs. Vertical standards are public goods because they are freely obtained from sponsoring organizations without investing resources in their development, which gives rise to linked collective action dilemmas at the development and diffusion stages. Firms must be persuaded to invest in development without being able to profit from the output, and a commitment to ensure the diffusion of the standard must be secured from enough potential adopters to guarantee success. In this paper, the authors explore organizational drivers for participation in vertical standards development activities for supply- and demand-side organizations (i.e., vendors and end-user firms) in light of the restrictions imposed by these dilemmas.

INTRODUCTION

Standards play a major role in a firm's competitive position, often making the difference between success and failure (Mitchell, 1994). Compatibility standards define physical and technical interfaces

between products and information systems (David, 1987) and are developed in various ways, of which committee-led efforts are most desirable when coordination, not competition, is the primary concern (Farrell & Saloner, 1988). A new class of compatibility standards known as vertical

standards has emerged in the last decade. Vertical standards focus on business processes and data formats specific to individual industries (Markus et al., 2003), and are generally implemented using the eXtensible Markup Language (XML) due to its flexibility and extensibility. XML-based vertical standards are incomplete products, in a constant state of evolution and growth, which permits firms to continually add functionality to reflect changing business processes and data formats not originally included in the standard. While some adopters may be satisfied with the initial version of an XML-based vertical standard, others will continue to participate in further development and push for increased functionality. XML-based vertical standards exhibit public goods (Olson, 1971) properties, since they can be obtained free of cost from the sponsoring consortium or standards-developing organization (SDO) without having to invest resources in their development. This gives rise to two linked collective action dilemmas at the development and diffusion stages (Markus et al., 2006) which consortia must identify and solve in their specific industries. At the development stage, firms must be persuaded to invest in XML-based vertical standards development even when copyright policies of the sponsoring consortium or SDO typically prevent the commercial appropriation of the results of the development process by any participant. At the diffusion stage, a commitment from enough potential adopters is crucial to ensuring an XML-based vertical standard's success (Markus et al., 2003). Thus, developers must make a potentially irrecoverable investment, and a critical mass of adopters must be recruited from firms without a stake in the success of the standard. This paper adds to the growing literature on vertical standards by exploring the motivation for participation in the development of vertical standards for supply- and demand-side organizations, i.e., vendors and end-user firms, in the face of these linked dilemmas. We test two linear regression models using constructs that explore the effect of resource and interest heterogeneity

in the participation of demand- and supply-side firms in XML-based vertical standards development activities

Literature Review

IT standards are common technical specifications that define product or system interface and compatibility characteristics (David & Greenstein, 1990). Standards are subject to network externalities (Rohlf's, 1974), and are vulnerable to start-up and discontinuance problems (Markus, 1987) due to high consumer adoption costs when a dominant standard does not exist (Axelrod et al., 1995). Dominant standards may emerge as the result of free-market forces (*de facto*), by legislative mandate (*de jure*), or through coordinated sponsorship by consortia or SDOs (consensus; Farrell & Saloner, 1988; David & Greenstein, 1990). In general, the emergence of dominant standards is subject to three well-understood effects (Quelin et al., 2001): increasing returns, path dependence, and irreversibility. Increasing returns make the utility of a standard greater for the (n+1)th user than it was for the nth user (Rohlf's, 1974; Arthur, 1994). Path dependence is the degree to which standardization outcomes are influenced by small-event history in the development and diffusion of a standard (Arthur, 1994), and can trap firms into the wrong technical platform. Irreversibility refers to inflexion points in the cumulative diffusion curve which make a change to any other outcome not possible for long periods of time (Henry, 1974). All these effects play a role in the decision by members of an industry to standardize on a single technology. Increasing returns affect all non-legislated standards types, but consensus standards have been argued to be more likely to enlist supporters than proprietary technologies seeking to become *de facto* standards (Greenstein, 1992). Consensus standards allow firms to participate and control development, offering a chance to reduce path dependence, but increased participation increases standards complexity (Markus et

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