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Organizational Standards Strategy

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Abstract
Standardization of innovative technology can create great competitive advantage for organizations. In addition, the consequences of interactions between organizations as they implement their standards strategies can have great socio-economic impact, especially with the current convergence in information and communications technology. The existing research on standards uses economic theories to explain how economic factors stimulate technology standardization and game theory to analyze how organizations collaborate on standardization, but these theories both overlook the issue of how organizations make decisions about their standards strategies and the results of their interactions with other actors. Thus, the main part of the research question is: how do organizations reach their strategies for standards, during and after the standardization process? To answer this question, we need a holistic perspective to analyze the context of organizational standards strategy, including the situation of any given organization and how the organization interprets its situation to choose or develop a strategy for standards. This paper presents a framework based on combining two theories, ANT (Actor Network Theory) and Self-Organized Complexity.

Keywords: ICT standard, Standards strategy, Actor Network Theory, Self-Organized Complexity

In the modern business environment, forces such as transformations in customer tastes, evolution of technologies, and changes in regulations are making the life cycles of products and services shorter and their markets more competitive (D'Aveni 1994; Ilinitch et al. 1996). To compete in this environment, organizations must act quickly and strategically to develop and implement effective technologies in their operations and their products and services. Therefore, the ability to control or influence standardization of these technologies is becoming a critical part of organizations’ business strategy (Grindley 1995).

The term “standard” is commonly used in daily life with various meanings such as reference, minimum quality, and compatibility (interface) between components (Bekkers 2001). Research on technology standards first grew in the 1980s, examining the roles and types of standards used in the rapidly growing information and communications technology (ICT) sector (David and Greenstein 1990). Due to the intense compatibility needs required for a complete product or service in the ICT sector, standards play a highly significant role, whether they arise from market competition, regulation, or some degree of collaboration between organizations (Bores et al. 2003; Yoffie 1996; Chiesa and Toletti 2003). This research will focus on compatibility (interface) standards in the ICT sector.

Standards strategy is an organization’s long-term plan to achieve its goals by using standards to gain or sustain competitive advantage (Bekkers 2001; Grindley 1995). An organization that first develops a standard or adopts it early on can gain great competitive advantage and also sustain competitive advantage in the post-standardization period, after a
standard has been widely established, by locking-in its users with greater economy of scale (Bekkers 2001; Grindley 1995; West and Dedrick 2000). In order to do this deliberately, an organization can create strategies for developing or implementing standards (Grindley 1995; Tassey 2000).

There are three main strands in the body of literature on technology standards. One focuses on economic factors involved in spreading a technology to make it into a standard (e.g. David and Steinmueller 1994; Katz and Shapiro 1985; Liebowitz and Margolis 1994). Some examples of these economic factors are economies of scale, network externality, and the bandwagon effect. The second strand looks at the agents of standardization, whether standards emerge without an identified originator, from government regulation, or by deliberate action of organizations working singly or together (e.g. Besen and Farrell 1994; Chiesa and Toletti 2003; David and Greenstein 1990). The third trend in the literature focuses on the role of IPR (Intellectual Property Rights) in standards strategies, for example, how organizations weigh protection of their rights with the necessity of opening up their technology in order to spread it (e.g. Blind and Thumm 2004; Lea and Hall 2004; Lemley 2002).

However, what is not clearly evident from the literature is an account of why organizations choose certain strategies. How does any given company decide how to stimulate the necessary economic factors to spread its technology, how to create an effective network using that technology, how much to work with collaborators or go it alone, and whether to close or open IPR? What influences these decisions? What elements in a company’s situation will lead it to make one choice or another? In this research, I propose to go beyond a listing or categorizing of the types of standards strategies and try to understand why organizations choose certain strategies. Therefore, the first part of the research question is: what are organizational strategies for technology standards? I will draw heavily from previous researchers to reframe their analyses of organizational actions clearly as strategies. The main part of the research question is: how do organizations reach their strategies for standards, during and after the standardization process?

To answer these questions, we need a holistic perspective to analyze the context of organizational standards strategy, including the situation of any given organization and how the organization interprets its situation to choose or develop a certain strategy. While previous research draws on theories including Game Theory and Economic theories, this paper presents a framework based on combining two theories, ANT (Actor Network Theory) and Self-Organized Complexity.

According to Kaghnan and Bowker (2001), an actor network is defined as “any collection of human, non-human, and hybrid (human/non-human) actors who jointly participate in some organized (and identifiable) collective activity in some fashion for some period of time” (p. 258). The network is not always intrinsically coherent and can include conflicts between actors. For this reason, the network can change and fall apart over time. ANT is useful because it takes into account the complexity of real life and can explain the interactions of organizations. However, ANT cannot explain the context in which actors make decisions – why do certain networks emerge and how do they emerge? (Gao 2005) In order to answer these questions, we need to be able to analyze industry-wide dynamics and the larger picture of many organizations acting at once. For this purpose, I will draw on the theory of Self-organized Complexity.

Self-organized Complexity, which is also called Complexity Theory or Self-organization Theory, focuses on self-organization in complex phenomenon. Self-organization occurs when a configuration or pattern emerges from the interaction of various independent actors over time, without the intervention of a central controller (Drazin and Sandelands 1992; Anderson 1999). Technology standardization demonstrates the characteristics of self-organized complexity, such as the existence of numerous actors and non-linear interactions that lead to the emergence of configurations or patterns as a result of the collective behavior of interacting actors. The outcome of complicated strategies and interactions between organizations striving for technology standardization emerges somehow in an organized form, such as an agreed-upon technology standard developed through a voluntary standard-setting collaboration by various firms, or a standard that emerges as dominant from market competition.

Therefore, this research proposes to integrate the two theories, self-organized complexity and ANT, to create a theoretical approach that can provide a holistic analysis of technology standardization. Self-organized complexity provides a way to analyze the overall phenomenon of technology standardization (Anderson 1999), because it acknowledges the existence of many actors and interactions between actors to form recognizable configurations and patterns. ANT can help us understand the dynamics of actors within the phenomenon. Therefore, the combination of these two theories should allow us to explain not only the standards strategies of individual organizations, but how the strategies interact and their results and unexpected side-effects. More specifically, I propose that the process looks something like this: (1) the existing self-organized configurations or patterns of technologies affect each individual organization’s situation; (2) each organization interprets its situation through its orientation, values, and goals; (3) each organization creates strategies based on its interpretation and takes actions according to these strategies; (4) these actions of individual organizations interact to create or shape a network; and (5) the networks of organizations affect the existing self-organized structures or patterns of technologies. This process repeats to continuously unfold industry- or market-wide self-organized structures and patterns.

In order to more systematically analyze organizational situation, an organization’s interpretation of its situation, and standards strategy, I have identified specific elements or aspects of each. These elements or aspects are derived from a review of the literature on standards and supported by the perspective of value creation and capture, which is an important view in theories of organizational strategy (Lepak et al. 2007). At least six fundamental elements of an organization’s situation can be identified with respect to technology standards: an organization’s capabilities to meet market needs and opportunities, the availability of complementary products in the market, the innovativeness of the technology involved, the position of the organization in the market, the availability of alternative or substitutable technologies in the market, and the characteristics of
intellectual property rights regarding the technology involved. Elements to analyze organizational interpretation are more difficult to identify. Although it is impossible to fully understand an organization’s interpretation of its situation as an outside investigator, I will derive possible interpretations from the perspective of value. At the very least, we can say that an organization evaluates its situation from the perspective of creating and capturing value: for example, what value its resources and capabilities add or create to existing products and services; whether value can be sustained in potential future markets; whether its situation is advantageous for creating or capturing value for possible market needs and opportunities. Finally, I will analyze organizational standards strategy from three aspects: configuration of value network, formation of standard-setting, and openness of IPR (Intellectual Property Rights).

The proposed methodology for this research is the case study. Benbasat et al. (1987) define a case study as follows: “A case study examines a phenomenon in its natural setting, employing multiple methods of data collection to gather information from one or a few entities (people, groups, or organizations).” Applying their criteria, we can say that the case study is appropriate for this research, because the standardization phenomenon needs to be studied in its natural setting, the research question is a question of “how,” there have been few previous studies in ICT standards strategy area, and research in this field is in its early formative stages, even though IS researchers have paid more attention to this issue lately, for example, the August 2006 MIS Quarterly special issue on standard making (Lyytinen and King 2006).

The main case study that is the focus of this research will be the evolution of wireless telecommunication standards from the first generation (1G) through the third generation (3G). Wireless telecommunications is a significant sector of the larger information and telecommunications field, and the history of its development shows the increasing complexity necessary to generate self-organization. The evolution of this phenomenon includes many actors creating and implementing various standards such as GSM, CDMA, WCDMA, and CDMA2000, so it can include various sub-cases. Data for case studies will be collected through primary sources such as interviews and secondary sources such as litigation records, company announcements, and newspaper articles. Litigation records related to IPR and anti-trust lawsuits are one of the most important and interesting sources; these rich data have been used by researchers from the legal field, but they also reveal important aspects of organizational strategies and actions for IPR.

The potential contributions of this research are: (1) suggesting the importance of organizational standards strategy as a way for organizations to gain or sustain competitive advantage, and understanding how organizations arrive at these strategies; (2) opening up a new avenue to highlight the field of organizational standards strategy as an important part of overall business strategies; and (3) suggesting a holistic method to understand complex phenomena by integrating two existing theories (Self-organized Complexity and Actor Network Theory).

References


