Electronic Data Interchange: A New Frontier for Global Standards Policy

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Electronic data interchange (EDI) has become an important enabling technology for the creation of a global business environment. It is also raising issues for global standards policy. This article traces the evolution of EDI standards in the United States and in the European Community. It illustrates the fundamentally different perspectives on standards policy by contrasting the approach to EDI standards development each has taken. EDI standards development in the United States, consistent with the American preference for market-based, pluralist policy, is “bottom-up,” reflecting a competitive policy perspective. In contrast, the EDI standards development process in the European Community, where standards are viewed as a vehicle for unification is a “top-down,” exhibiting a cooperative policy perspective. Given the differences in approach, compromise is required on both sides if the global harmonization of EDI standards is to be achieved.

Electronic data interchange (EDI) is emerging as one of the central enabling technologies for the creation of a global business environment. Throughout the world, firms are increasingly enmeshed in complex networks of transactions and operations. Customers are changing as well, becoming more global, and demanding swifter response and more customized products. Within the global economy, there is increasing need for companies to create linkages across their chain of value-adding activities, to meet the requirements of intensified competition and sophisticated customer demands. The swift, accurate movement of electronic information throughout business processes has become a critical component of strategic advantage, and is driving fundamental developments in the international telecommunications infrastructure. Increasingly, firms are moving towards tighter coupling with their corporate suppliers and customers. In the words of the French political scientist Albert Bressand, the international business environment is “moving from an age of trade-centered interdependence to an age of network-driven interconnection” (Bressand, 1989).

New information technologies such as EDI affect the internal and external activities of firms in several ways. First, the speed of transactions can be greatly increased, which in turn accelerates business processes. Second, since physical distance among firms is largely irrelevant to electronically transmitted information, new opportunities arise for the coordination and integration of spatially distributed operations. Third, new interdependencies among enterprises can be created. In doing so, intermediaries which slow speed and increase the cost of information transmission and access are bypassed. (U.S. Congress, 1990).

The intent of this article is to consider the differences in approaches to EDI standards between the United States and the European Community, and to suggest some implications for global standards policy. We begin by stating the case for EDI. We then describe the development of EDI standards in the United States. In the United States, EDI policy has evolved in a “bottom up” fashion consistent with a decentralized approach to
other aspects of information and telecommunications policy formulation (Trauth, 1986). That is, standards have developed on an industry sector basis in response to developments in the marketplace. We then show how, in contrast, the European experience with EDI standards has been “top down,” in response to leadership and incentive programs in the European Community. In both cases, these differences in EDI policy formulation are shown to be consistent with the overall approaches to standards policy in other areas. We conclude by raising issues which both the United States and the European Community must address if a global EDI policy is to be achieved. The United States and the European Community have been chosen for this comparative study of EDI standards because each represents opposite ends of the standards policy spectrum.

Why EDI?

EDI is the computer-to-computer exchange of structured business information. This information typically takes the form of standardized electronic business documents, such as invoices, purchase orders, bills of lading, and so on. Unlike unstructured computer-based information exchanges such as electronic mail or fax, EDI involves specific documents in standardized formats. EDI exchanges may move within or between firms. (See the Appendix for a glossary of EDI terminology.)

By reducing the cost of, and potential for, error in transmitting and re-keying paper-based transaction information, EDI can offer significant savings in both cost and time. For example, at one of its manufacturing plants, Digital Equipment Corporation lowered the cost of processing purchase orders from $125 to $32, and cut delivery time from five weeks to three days after implementing an EDI system (Korzeniowski, 1989). By using EDI to improve purchasing forecasts, Hewlett-Packard reduced manufacturing lead times from 16-24 weeks to 2-4 weeks (Ioannou, 1990).

Such improvements in efficiency and cost which derive from moving to electronic data exchange indicate the magnitude of documentation generated by cash and information flows within and between firms. Horan has estimated that the average inter-firm transaction generates thirty documents, ranging from pre-order processing (including information exchanges of catalogs, price lists, and requests for quotes), to order processing (purchase orders, acknowledgements, status requests and responses), through production (materials release forms) and transportation (exchanges between shipper, carrier, and receiver) to billing, credit and funds transfer documentation (Horan, 1989). Each of these paper-based documents requires numerous keying and re-keying operations, as well as physical transfer through the mails, with multiple chances for error, delay, and confusion.

Businesses expect a range of benefits to accompany the movement to EDI. Within the firm, these include: reducing time delays; lowering error, labor and clerical costs; improving cash and information management; and gaining competitive advantage through value-added information. Between firms, benefits accrue in relations with both suppliers and customers. Linking with suppliers by EDI can reduce inventory costs and streamline delivery schedules. EDI links to customers can increase responsiveness, enhance customer service, and create new opportunities for personalized products and services.

Driven by increasing awareness of the benefits of EDI, the total level of EDI expenditures by US firms exceeded $250 million in 1990 (Gartner Group, quoted in Ioannou, 1990). Estimates of growth rates vary, but range from 40% to 70% annually, to make EDI a multi-billion dollar market by the end of the decade. By 1991, an estimated 12,000 US firms were using some form of EDI with suppliers and/or customers, and that number is expected to triple by the mid-1990s (Dreyer, 1990:20).

Growth of EDI usage and spending has been much less rapid in Europe. In 1990, European firms spent a total of about $50 million on EDI, only one-fifth the US level. There are between 4,000 and 5,000 EDI sites in Europe (out of some six million organizations), or 22% of the world total. A recent market study by the British firm Ovum predicts a nearly $400 million European EDI market by 1994, and a 12-fold growth in EDI traffic by 1995 (Lawrence, 1990). European EDI usage is strongly concentrated in the United Kingdom. The UK accounted for 90% of EC EDI expenditures, and 70% of the sites (“EDI in Europe,” 1991). The unified European market is generating a considerable increase in transborder electronic traffic, leading to at least a 25% reduction in document generation and reproduction costs (Etheridge, 1988).

Although by the early 1990’s EDI was growing rapidly in both the United States and the European Community, diffusion of both the technology and the standards setting process took different paths. The following sections examine these differences and the implications for global standards policy.
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