

December 1996

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Satish Vasudevan
Syracuse University

Yu-Ming Wang
Syracuse University

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Recommended Citation

Vasudevan, Satish and Wang, Yu-Ming, "Technology Adoption in the Presence of Knowledge Barriers: The Case of the World Wide Web" (1996). *ICIS 1996 Proceedings*. 50.
<http://aisel.aisnet.org/icis1996/50>

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TECHNOLOGY ADOPTION IN THE PRESENCE OF KNOWLEDGE BARRIERS: THE CASE OF THE WORLD WIDE WEB

Satish Vasudevan
Yu-Ming Wang
Syracuse University

Much of the technology diffusion research has focused on the “intention to adopt” of an adopting unit to explain its adoption behavior — the opportunity for adoption and the underlying adoption propensity is often not differentiated. However, the “opportunity to adopt” need not be uniform among adopting units. From the perspective of organizational learning, it is argued that the differential opportunity to adopt originates from knowledge barriers and varied access to supply-side institutions that can lower these barriers (Attewell 1992). This perspective of technology diffusion raises three interesting research questions:

- a) *Do the knowledge barriers faced by a firm, with respect to a technological innovation, affect its adoption time?*
- b) *Does the availability of services from supply-side institutions facilitate early adoption?*
- c) *What are the firm-level and industry-level attributes that determine the knowledge gap experienced by an adopting unit?*

This research differentiates between “adoption opportunity” and “adoption propensity,” and suggests that the “opportunity to adopt” critically influences the timing of technology adoption. A set of hypotheses relating the adoption time to knowledge barriers and to the availability of supply-side institutions is offered. Specifically, it is argued that lower knowledge barriers and greater access to supply-side institutions will enable earlier adoption. Further, the level of involvement of the supply-side institution in the adoption process may vary with the knowledge barrier of the adoption unit. Hypotheses are also offered regarding firm-level and industry-level factors that determine the knowledge barriers of an adopting unit with respect to a technological innovation.

The World Wide Web (WWW), a recent technological innovation, provides an interesting context for empirically validating the organizational learning perspective of technology diffusion. The low investment requirements, the high popularity of the technology among households (potential customers), and the significant benefits that can be derived (reduced advertisement and transaction costs, greater product visibility, etc.) combine to create a high intention to adopt among firms. As such, the adoption behavior may be dependent on potential knowledge barriers. Further, the WWW technology has brought into existence the largest set of supply-side institutions providing services ranging from training to complete infrastructural support.

A survey-based methodology is being used to collect data on WWW technology adoption from a varied set of firms who are members of a trade association. Different levels of WWW technology adoption can be specified; this study defines WWW adoption at the lowest level, namely, the establishment of a web site for disseminating product/service information. The dependent variable, the elapsed time to adopt, may be right-censored, and hence, we will employ an econometric technique called *hazard modeling* that will accommodate censoring. More specifically, to test the hypotheses, we will construct and estimate a hazard model assuming that the elapsed time to adopt is conditional on the explanatory variables. The findings of this study may a) explain why certain firms delay their adoption of potentially profitable innovations, b) imply suitable diffusion strategies for firms promoting innovations, and c) provide information on how firms are adopting a new and highly knowledge-intensive technological innovation, namely, the World Wide Web.

REFERENCE

Attewell, P. “Technology Diffusion and Organizational Learning: The Case of Business Computing.” *Organization Science*, Volume 3, Number 1, 1992, pp. 1-17.