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Paul Chwelos
University of British Columbia

Izak Benbasat
University of British Columbia

Albert Dexter
University of British Columbia

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THE ADOPTION AND IMPACT OF ELECTRONIC DATA INTERCHANGE: A TEST OF INTERNAL AND EXTERNAL FACTORS

Paul Chwelos
Izak Benbasat
Albert S. Dexter

University of British Columbia

Electronic data interchange (EDI) is one form of electronic commerce (EC) that promises adopting firms benefits that include cost savings through increased efficiency, improved transaction accuracy, improved managerial control, reduced inventory levels, faster cycle times, and the possibility for strategic repositioning of the firm (Bergeron and Raymond 1992). However, EDI has not achieved the predicted penetration levels, for reasons that are not yet fully understood (Bouchard 1993).

The adoption of EDI has been studied from the perspective of diffusion of innovations (Premkumar et al. 1994), which focuses on the attributes of the technology. Recent research has also focused on the interorganizational nature of EDI by specifically considering the relationship between the two organizations considering EDI (Saunders and Clark 1992; Premkumar and Ramamurthy 1995). The aim of this study is to test a model that incorporates both viewpoints (Iacovou et al. 1995).

In the Iacovou et al. model, three factors determine the adoption and integration of EDI: *perceived benefits*, *organizational readiness*, and *external pressure*. Perceived benefits closely approximates the construct of relative advantage that is central in diffusion of innovations research (Rogers 1983). Organizational readiness is a measure of the necessary technical and financial resources that are precursors to the adoption of EDI (Swatman and Swatman 1991). External pressure captures the power and influence strategy used by the prospective EDI trading partner.

This paper empirically tests the model through a survey of Canadian senior purchasing managers. The questionnaire underwent two rounds of pilot testing and was sent to 544 members of the Purchasing Managers Association of Canada (PMAC). These managers were chosen as the sample frame because of their proximity to the organization's EDI adoption decision: (1) the purchasing function has been shown to be one of the largest adopters of EDI and (2) senior managers have the necessary perspective and authority to be included in the adoption decision. There were 320 usable responses, which are undergoing analysis using structural equation modeling.

A subsample of responses were reserved for an item analysis and, on the whole, the resulting constructs demonstrate reasonable to excellent reliability. Initial results of the partial least squares analysis suggest that, while adoption is strongly related to both perceived benefits and external pressure, organizational readiness is less significant.

REFERENCES

- Bergeron, F., and Raymond, L. "The Advantages of Electronic Data Interchange," *Database* (23:4), 1992, pp. 19-30.
- Bouchard, L. "Decision Criteria in the Adoption of EDI," *Proceedings of the Fourteenth International Conference on Information Systems*, J. I. DeGross, R. P. Bostrom, and D. Robey (eds.), Orlando, FL, 1993, pp. 365-376.
- Iacovou, C. L.; Benbasat, I.; and Dexter, A. S. "Electronic Data Interchange and Small Organizations: Adoption and Impact of Technology," *MIS Quarterly* (19:4), December 1995, pp. 465-485.

Premkumar, G., and Ramamurthy, K. "The Role of Interorganizational and Organizational Factors on the Decision Mode for Adoption of Interorganizational Systems," *Decision Sciences* (26:3), May/June 1995, pp. 303-336.

Premkumar, G.; Ramamurthy, K.; and Nilakanta, S. "Implementation of Electronic Data Interchange: An Innovation Diffusion Perspective," *Journal of Management Information Systems* (11:2), Fall 1994, pp. 157-186.

Rogers, E. M. *Diffusion of Innovations*, Free Press, New York, 1983.

Saunders, C. S., and Clark, S. "EDI Adoption and Implementation: A Focus on Interorganizational Linkages," *Information Resources Management Journal* (5:1), Winter 1992, pp. 9-19.

Swatman, P. M. C., and Swatman, P. A. "Electronic Data Interchange: Organizational Opportunity, Not Technical Problem," *Proceedings of the Second Australian Conference on Database and Information Systems*, 1991.