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AMCIS 2004 Proceedings

Americas Conference on Information Systems (AMCIS)

December 2004

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ABSTRACT

Studies of e-business adoption have generally been restricted to understanding organizational factors. Institutional factors provide an alternate explanation of the diffusion of e-business across organizations. We test the influence of coercive, normative, and mimetic pressures on first-time adoption of B2B and B2C innovations by organizations. We further propose that an organization's response to institutional pressures may be affected by its distinctive organizational identity. Specifically, we hypothesize that those organizations that value innovation and customer service will be more likely to adopt e-business over time. We test the likelihood that the intensity of institutional pressures will vary over different time periods. Data are gathered from secondary sources and we use event-history techniques to test our model. We contribute to the IS literature by integrating institutional and organizational identity concepts to understand the adoption and diffusion of Type III innovations.

Keywords

E-Business, Institutional Theory, Organizational Identity.

INTRODUCTION

E-Business, which includes Business-to-Business (B2B) and Business-to-Consumer (B2C), is defined as the "marketing, buying, selling, delivering, servicing, paying for products, services, and information across (non-proprietary) networks linking an enterprise and its prospects, customers, agents, suppliers, competitors, allies, and complementors" (Weill and Vitale, 2001). E-Business may be classified as a Type III innovation, which integrates information systems (IS) products and services with core business technology, and typically impacts general business administration (Swanson, 1994).

Research on organizational adoption of Type III innovations has generally been restricted to organizational factors such as organization size (Grover, 1993), top management support (Premkumar et al., 1997) and slack resources (Grover, Fiedler and Teng, 1997). Most studies have not examined environmental variables in the context of Type III innovations. One exception is Teo, Wei and Benbasat (2003) who use a neoinstitutional framework to study the adoption of financial electronic data interchange. Their study looks at intention to adopt at one point in time. In contrast, our study examines the impact of institutional pressures on the diffusion of Type III innovations over time. Institutional pressures include mimetic, coercive, and normative (DiMaggio and Powell, 1983), and lead organizations to conform to the environment. We further propose that organizations' responses to institutional pressures may be affected by their distinctive organizational identities (Albert and Whetten, 1985).

E-BUSINESS ADOPTION

Our discussion of e-business includes two categories: B2B and B2C. B2B supports the selling of products and services between corporations and involves suppliers, distributors, manufacturers, and stores (Korper and Ellis, 2000). B2C deals with consumer products and supports the selling and marketing of goods and services between an organization and its consumers (Korper and Ellis, 2000).

Researchers have examined intention to adopt, decision to adopt, time of adoption, rate of adoption, swiftness of adoption, intensity of adoption, and earliness of adoption of innovations (Grover, 1993; Premkumar et al., 1997; Rogers, 1995). In this research, we study the rate and timing of B2B and B2C adoption by organizations.

Institutional Pressures

Organizations typically respond to an institutional environment that comprises shared conceptions of appropriate organizational forms and behaviors (Meyer and Rowan, 1977). As organizations compete for resources and customers, they face pressures to become isomorphic with the environment to acquire and sustain legitimacy and the ability to secure resources and social support (DiMaggio and Powell, 1983).

Coercive Pressures

Coercive pressures result from resource-dominant organizations, regulatory bodies, and parent corporations that constrain resource-dependent organizations (DiMaggio and Powell, 1983). Strategic partnerships can be a source of coercive pressure when companies enter into these arrangements with organizations larger than themselves. Larger organizations are typically resource-dominant organizations and place the smaller focal organization into a resource dependence relationship (Pfeffer and Salancik, 1978). A focal organization is more likely to adopt e-business innovations when its larger strategic partner has previously adopted similar innovations.

H1: *Prior adoption of B2B by larger strategic partners is positively related to the rate of B2B adoption by organizations*.

Normative Pressures

Normative pressures result from expectations of professionals regarding how work should be conducted (DiMaggio & Powell, 1983). These expectations are transmitted through educational organizations, social networks, and professional and trade organizations, and establish a cognitive basis for the legitimation of occupations.

The Information Systems (IS) function has traditionally undertaken the design and development of IS innovations in organizations and initiated a process of legitimation for the IS function (Sauer, 1993). Legitimation of the IS function is symbolized by an organization's appointment of a senior IS executive, such as the Chief Information Officer (CIO) (Chatterjee, Richardson and Zmud, 2001). The presence of a senior IS executive may increase the likelihood that the organization will adopt e-business innovations. This may be attributed to the senior IS executive's knowledge of the potential for exploiting IS capabilities and affiliation with professional associations that inform state-of-the-art innovations such as e-business.

H2A: *Presence of a senior IS executive is positively related to B2B adoption by organizations*

H2B: *Presence of a senior IS executive is positively related to B2C adoption by organizations*

Mimetic Pressures

Mimetic pressures derive from uncertainty and lead organizations to model themselves on others in their organizational fields (DiMaggio and Powell, 1983). Two mimetic mechanisms are: bandwagon and status-driven.

The bandwagon model of imitation proposes that organizations adopt innovative practices that are used by a large number of other organizations. Adoption decisions are made relatively indiscriminately due to the lack of useful information from the early adopters other than the knowledge that they have adopted (Kraatz, 1998). In an e-business context, a focal organization may adopt B2B or B2C innovations based on the knowledge that its competitors have adopted similar innovations.

H3A: *Prior adoption by other organizations in the same industry is positively related to the rate of B2B adoption by organizations*

H3B: *Prior adoption by other organizations in the same industry is positively related to the rate of B2C adoption by organizations*

The status-driven imitation model specifies that organizations adopt practices previously implemented by prominent organizations (Kraatz, 1998). This is because the focal organization believes that imitating prominent organizations will result in legitimacy gains. Therefore, the focal organization may adopt B2B or B2C innovations when the more prominent organizations have adopted similar innovations.

H4A: *Prior adoption by the more prominent organizations in an industry is positively related to the rate of B2B adoption by organizations*

H4B: *Prior adoption by the more prominent organizations in an industry is positively related to the rate of B2C adoption by organizations*

Organizational Identity

Organizational identity represents those features that are central, enduring, or distinctive in character about the organization (Albert and Whetten, 1985). The identity attributes reflect the underlying values of the organization (Gustafson and Reger, 1995). Organizational identity may complement or deter adoption of e-business in the presence of institutional pressures. For instance, organizations that define themselves as "innovative" or "customer-centric" may be more responsive to institutional pressures for adoption as these innovations reproduce and extend their identities. Organizations that lack such identities may resist adoption pressures from the environment.

H5A: *Pro-innovative or customer-centric identity is positively related to the rate of B2B adoption by organizations*

H5B: *Pro-innovative or customer-centric identity is positively related to the rate of B2C adoption by organizations*

Innovation Periods

Different innovation periods may be characterized by varying rates of e-business adoption based on varying institutional pressures. We determined three distinct periods of e-business innovation based on critical events in technology development.

Early Period: 1987 – 1990

The first critical event is the initiation of the commercial Internet backbone in 1987 (Moschovitis et al., 1999). During this period, the Internet was primitive and relegated, primarily, to research and educational facilities. The Internet was difficult to use and required considerable technical skills from users. E-Business systems were not widespread. This period may be used as a baseline model to which the other periods can be compared and contrasted.

Middle Period: 1991 – 1996

The second critical event is the invention of the World Wide Web (WWW) in 1991 (Jessup and Valacich, 2003). The WWW was built on top of the Internet infrastructure and provides a user-friendly mechanism for Web applications including B2B and B2C systems. According to Tolbert and Zucker (1983), early implementers tend to adopt innovations to pursue specific organizational goals. Large organizations entering into strategic partnerships may use their slack resources to experiment with new systems, such as e-business, that facilitate business transactions with their partners. Consequently, the smaller organizations in strategic partnerships with their larger counterparts will be influenced to adopt e-business.

H6: *During the middle period, coercive pressures were more influential than mimetic or normative influences on the rate of B2B adoption by organizations*

Current Period: 1997 – 2003

The third critical event is the standardization of the WWW protocols, such as HTML 4.0, in 1997 (WWW Consortium). Standardization established a common cognitive base for building e-business systems. Educational and professional institutions imparted training on these standards and the IS profession also embraced them. Further, organizations followed early adopters and implemented e-business systems such that they are perceived as legitimate entities.

H7A: *During the current period, mimetic and normative pressures are more influential than coercive influences on the rate of B2B adoption by organizations*

H7B: *During the current period, mimetic and normative pressures are more influential than coercive influences on the rate of B2C adoption by organizations*

RESEARCH METHOD

Data collection is for the period between 1987 and 2003; this study examines the adoption of B2B and B2C innovations since their inception times. Our sample consists of 150 U.S. companies drawn from the S&P-500.

Operationalization

B2B and B2C adoption, at the level of the organization, is coded as the year in which the organization first adopted the innovation. The rate of B2B and B2C adoption, at the level of the population, is a cumulative count of the number of

organizations adopting the innovation over time. This information will be obtained from articles in the popular press identified by electronic search engines, such as Lexis Nexis, and company press releases.

Coercive pressures: We will determine the size of the companies with which the focal organization had strategic alliances prior to the adoption of B2B. When a larger strategic partner has previously adopted B2B, coercive pressures will be coded 1 for the year in which the strategic alliance was created and 0 otherwise. This information will be found in company 10K reports and the popular press.

Mimetic pressures: We identify the competitors for each organization by finding the organizations with the same GICS sub-industry code as the focal organization. Then, the year of B2B or B2C adoption by the competitors will be determined. The bandwagon mimetic pressure will be measured by assessing the extent of e-business adoption by competitors prior to the focal organization (the ratio of adopting competitors to the total number of competitors). The status-driven mimetic pressure will be measured by assessing the extent of e-business adoption by successful competitors prior to the focal organization (the ratio of successful competitors adopting e-business to all competitors). Competitors will be identified from COMPUSTAT and competitor adoption of e-commerce will be gathered from the popular press.

Normative pressures: We identify the year in which the organization first instituted a senior executive position for Information Technology such as CIO or Executive VP of IT. Normative pressures will be coded 1 for the year in which a senior IS executive position existed and 0 otherwise. This information will be found in company annual reports and company web sites.

Organizational identity will be measured by conducting an analysis of the mission or vision statements of organizations. We will identify phrases that capture core values of the organization such as "innovation" or "customer-centric". A categorical measure will be used to distinguish between organizations with distinctive identities from other organizations. We will get data about organizational identity from company mission and vision statements.

We control for organization slack since organizations with slack are more likely to have the resources and the inclination to experiment with innovations. Organization slack will be measured using organization size (the number of employees) and Return on Equity (ROE). We also control for industry since it is likely that e-business adoption patterns are different across industries due to differences in operations. These data will be obtained from COMPUSTAT databases.

Data Analysis

Data analysis will be conducted using event-history techniques which allow treatments for censoring of data (Grover et al., 1997). We will conduct separate analyses for the three innovation periods. Research is in progress and we will present the results at the conference.

REFERENCES

1. Albert, S. and Whetten, D. A. (1985) Organizational Identity *Research in Organizational Behavior,* **7,** 263-295.
2. Chatterjee, D., Richardson, V. J. and Zmud, R. W. (2001) Examining the Shareholder Wealth Effects of Announcements of Newly Created CIO Positions *MIS Quarterly,* **25,** 43-70.
3. DiMaggio, P. and Powell, W. W. (1983) The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields *American Sociological Review,* **48,** 147-160.
4. Evans, P. B. and Wurster, T. S. (2000) *Blown to Bits,* Harvard Business School Press.
5. Grover, V. (1993) An Empirically Derived Model for the Adoption of Customer-based Interorganizational Systems *Decision Sciences,* **24,** 603-640.
6. Grover, V., Fiedler, K. and Teng, J. T. C. (1997) Empirical Evidence on Swanson's Tri-Core Model of Information Systems Innovation *Information Systems Research,* **8,** 273-287.
7. Gustafson, L. T. and Reger, R. K. (1995) Using Organizational Identity to achieve Stability and Change in High Velocity Environments *Academy of Management Best Paper Proceedings***,** 464-468.
8. Jessup, L. and Valacich, J. (2003) *Information Systems Today,* Prentice-Hall Inc., Upper Saddle River, NJ.
9. Korper, S. and Ellis, J. (2000) *The E-Commerce Book: Building the E-Empire,* Academic Press, San Diego.
10. Kraatz, M. (1998) Learning by Association? Interorganizational Networks and Adaptation to Environmental Change *Academy of Management Journal,* **41,** 621-643.
11. Moschovitis, C.J.P., Poole, H., Schuyler, T. and Senft, T.M. (1999) *History of the Internet*, ABC-CLIO, Santa Barbara, CA.
12. Meyer, J. W. and Rowan, B. (1977) Institutional Organizations: Formal Structure as Myth and Ceremony *American Journal of Sociology,* **83,** 340-363.

13. Pfeffer, J. and Salancik, G. R. (1978) *The External Control of Organizations,* Harper & Row, New York, NY.
14. Premkumar, G., Ramamurthy, K. and Crum, M. (1997) Determinants of EDI Adoption in the Transportation Industry *European Journal of Information Systems,* **6,** 107-121.
15. Rogers, E. M. (1995) *Diffusion of Innovations,* Free Press, New York.
16. Sauer, C. (1993) *Why Information Systems Fail: A Case Study Approach,* Alfred Waller Limited, Hanley-on-Thames.
17. Swanson, B. (1994) Information Systems Innovation among Organizations *Management Science,* **40,** 1069-1092.
18. Teo, H. H., Wei, K. K. and Benbasat, I. (2003) Predicting Intention to Adopt Interorganizational Linkages: An Institutional Perspective *MIS Quarterly,* **27,** 19-49.
19. Tolbert, P. S. and Zucker, L. G. (1983) Institutional Sources of Change in the Formal Structure of Organizations: The Diffusion of Civil Service Reform, 1880-1935 *Administrative Science Quarterly,* **28,** 22-39.
20. Weill, P. and Vitale, M. R. (2001) *Place to Space: Migrating to eBusiness Models,* Harvard Business School Press, Boston, MA.
21. WWW Consortium, http://www.w3.org/MarkUp, referenced 04/13/04.