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Doing Business on the Internet: Insights from Information Systems and Organizational Theory Research

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The Internet is becoming an essential communication tool for North American businesses, but to date there has been little research on the expected impacts of using the Internet in a business context. This paper offers a taxonomy of theories of communication, information systems, and organizations, investigating what existing research can offer to businesses venturing onto the Internet. It concludes with a research agenda for those instances where existing theory does not inform business use of the Internet and its associated new communication technologies.

Introduction

A review of theories of organizations and information systems identifies four key areas where existing theory can inform businesses as they pursue electronic commerce opportunities: i) forces driving businesses onto the Internet; ii) theories of technology adoption; iii) theories of new technology implementation; and iv) technology-structure interactions. Table 1 categorizes theories that make up each perspective, and lists literature that discusses each theory. Space restrictions preclude detailed description of each perspective, thus it is assumed that the reader is relatively familiar with the theoretical underpinnings in each area.

None of the theories listed was specifically developed in the context of electronic communication technologies such as the Internet. However, there are many lessons that can be learned from a review of these theories.

Table 1: Theoretical Perspectives that Inform Business Use of the Internet

<p><i>Forces that Drive Business Onto the Internet</i> Garbage Can (Cohen, March & Olsen, 1972) Symbolic (Feldman & March, 1981) Technology Driven (Huff & Munro, 1985) Systems Rationalist (Kling, 1980)</p>	<p><i>Theories of Technology Adoption</i> Critical Mass Theory (Markus, 1990) Concurrent Deployment (Culnan & Markus, 1987; March & Sproull, 1990; Sproull & Kiesler, 1991) Adoption of Technological Innovations (Attewell, 1992; Rogers, 1983) Users' Perceptions of Technology (Davis, 1989 ; 1993; Davis, Bagozzi & Warshaw, 1989)</p>
<p><i>Theories of New Technology Implementation</i> Organizational Validity (Markus & Robey, 1983) Contextual Perspective (Kwon & Zmud, 1987) Organizational Context (Eveland & Tornatzky, 1990)</p>	<p><i>Technology-Structure Interactions</i> Technological Imperative (Woodward, 1965) Organizational Imperative (Jones, 1990; Mumford & Weir, 1979) Structuration (DeSanctis & Poole, 1994; Orlikowski, 1992)</p>

Businesses considering electronic commerce initiatives should start by investigating the forces that are driving them to adopt new technologies. Theory suggests that the mere existence of new technologies may be enough to encourage businesses to use them, before clear goals for their use are established. Thus, it is important for businesses to recognize their objectives, and ensure that their actions will enable their objectives to be met.

Technology adoption theories strive to explain why certain technologies are more widely used than others, and offer suggestions as to how to best encourage adoption of specific technologies. Implementation theories focus on organizational attempts to encourage the adoption of new technologies, as opposed to broad macro strategies for diffusion of innovation (Zmud 1984). Insights from the implementation literature can help businesses adopt technologies that are appropriate to their unique organizational requirements.

Technology-structure interactions should not be overlooked when assessing Internet technologies. Although there is a lack of consensus as to the exact causal links between technology adoption and structural change (Markus & Robey, 1988), it is often observed that structural change accompanies technological innovation.

Drawing from these four theoretical perspectives, Table 2 outlines a series of recommendations for businesses venturing into Internet activities. Although the reasons for each recommendation have not been explicitly outlined, they offer many insights for organizations considering doing business on the web. The key lessons are set forth below.

Table 2: Recommendations for Adopting Internet Technologies

Theoretical Perspective	Recommendations
Driving Forces	<ul style="list-style-type: none"> • identify reasons for establishing an Internet presence, or adopt the ambiguities of Internet activities into a business plan • understand the reasons for establishing an Internet presence before doing so • understand organizational goals before implementing new technologies • base technical decisions on organizational needs
Technology Adoption	<ul style="list-style-type: none"> • mandate use of new technology • select champions as role models • ensure appropriate technological standards are in place • plan phase out of old technologies and migration to new • understand all functionality of old technologies before implementing new ones • target business activities to early adopters • select test markets based on population size • focus attention on creating value in Internet services, in addition to making access simple
Technology Implementation	<ul style="list-style-type: none"> • understand organization and technology before implementation • involve users in design and implementation • target specific Internet activities to particular user groups
Technology-Structure Interactions	<ul style="list-style-type: none"> • consider potential changes in organizational structure when making human resource plans • expect that jobs of workers using new technologies will require some redesign • technology implementation plans must be developed for specific organizational settings • understand that consultants who develop Internet strategies for large corporations may not be equally good at developing strategies for smaller organizations • be adaptive and be prepared for many iterations when developing an Internet presence

Lessons from the Literature

1. Recognize that the Internet does not offer a solution to all problems. The Internet may not provide the best communication options for a given organization. Organizations must understand why they are planning to be on the Internet, even if the reason is symbolic alone. It is acceptable (and indeed recommended in many instances) for businesses to continue operating without using the Internet.
2. Understand the technology before planning to implement it. Ensure that both organizational and technological needs are being met in any proposal to adopt Internet technologies. Base technological decisions on organizational requirements, which must be clearly identified.
3. Target electronic commerce activities to early adopters, taking care to focus efforts on providing useful services. Plan for new technologies to supplant old ones in an orderly manner.
4. Involve customers and other technology users in design and implementation of Internet services. Understand user needs, so that specific activities can be targeted for given groups.
5. Understand characteristics of individual Internet technologies. Match media characteristics to business tasks.
6. Anticipate changes in organizational structure as communication patterns change. Be prepared to redesign jobs as necessary, and expect Internet development to be an iterative process.

Opportunities for Future Research

How valid are lessons based on existing research if the Internet and related technologies are substantially different from existing communication technologies and information systems? What limitations or caveats need to be considered in conjunction with the lessons just outlined? There are 4 main areas of concern that

must be recognized. These areas are discussed below, along with some research ideas that could address these concerns.

1. Although the impacts of using the Internet may be huge, the initial investment (small), ease of use (high), and the nature of the innovation make it different from other technological innovations. A web page can be created in 10 minutes with a word processor, thus design issues are substantially different from those for complex software or information systems. With minimal training, anyone can create a web page, unlike a decision support system, for example. Connecting to the Internet requires free software, a modem and a telephone, all of which are easily accessible. Thus, more research on Internet innovations is needed to determine whether traditional innovation patterns will apply.

This research could draw upon Rogers' (1983) work on diffusion of innovations. It would need to have two separate branches, one investigating adoption of Internet technologies by businesses, and the other looking at consumer behaviour patterns. Some of this work has begun, with organizations like Statistics Canada including questions about Internet usage in their surveys of household facilities and equipment (Mitchell, 1996). But it is up to academics to interpret this data and to determine research agendas. For example, just because individuals have access to the Internet does not mean that they use it regularly, or that they use it to access business sites. Furthermore, each individual's usage patterns are likely to be different, and there will be differences in behaviour between people accessing the Internet for business purposes (e.g. at work) and those using it for leisure (from home). Research should consider the importance of access to high bandwidth networks in determining usage patterns, something that can be investigated by interviewing and surveying participants in information highway trials (e.g. Pittsburgh's HomeNet project - see Kraut et al., 1996).

2. Innovation research generally focuses on how to get internal people to use a specific technology, not on how external users like customers might adopt the technology. In the case of businesses using the Internet, they have less influence over customer behaviour than employers have over their employees. For this reason then, it is not certain that the prescriptions from innovation research will be effective when encouraging external users to adopt new technologies. No doubt businesses will find ways to encourage new technology adoption by their customers. This is an area where IS researchers could focus their attention.

Specifically, researchers could investigate user perceptions of the value they receive from using the Internet. By surveying and interviewing people in settings where technology is readily available for high speed Internet access, it will be possible to isolate issues related to ease of use from those related to perceived usefulness. This provides an opportunity to test Davis's theories (1989, 1993), and to determine whether the best means to coax users onto the Internet is to convince them of its intrinsic value.

3. Implementation research also focuses on internal participants. There is little research that considers how to design systems for external customers, focusing instead on internal organizational needs. While the basic design principles of consultation and understanding user needs still apply, putting them into practice is much more difficult when the individuals or organizations for whom the design is being carried out are external to the designing organization. Researchers need to identify mechanisms by which external users can be consulted, but this is difficult when one of the strengths of Internet communication is that it facilitates contact with individuals or organizations previously unknown to the initiating business. Fortunately, information highway trial sites offer access to groups of external users who can become part of the consultative process.

4. Organizational structure is a difficult construct to conceptualize and measure, as it doesn't refer to a discrete physical property (Roberts & Grabowski, 1996). While it is expected that structure will be changed in some ways by the adoption of Internet technologies, it may be hard to determine when organizational level structural changes have taken place. It is suggested then that research looking at the organizational impacts of introducing Internet technologies focus on individual level issues first. For example, it is reasonably easy to determine whether a job has been changed as a result of adopting technology (this can be done by interviewing the employee or someone who deals with the employee on a regular basis, either

internal or external to the employee's organization). Longer term research can look at changes to organizational structure, but these may not be evident immediately upon adoption of new technologies. Structuration theory (DeSanctis & Poole, 1994; Orlikowski, 1992) should prove useful in understanding the dynamic, iterative nature of structural change.

Conclusions

Current research offers a number of important lessons for businesses contemplating the establishment of an Internet presence. However, as existing IS research has focused primarily on adoption and implementation of technologies significantly different to the networked communication technologies the Internet provides, there are some gaps in our understanding of how these new technologies will be adopted. Thus, there are two challenges for information systems researchers. The first is to disseminate what we already know about technological innovation, and apply it specifically to the Internet. The second is to undertake research projects aimed specifically at Internet technologies in order to fully understand the implications of their widespread adoption by businesses.

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