



MISRC/CRITO/DTC Symposium on the Digital Divide
Carlson School of Management, University of Minnesota
Minneapolis, August 27-28, 2004

The Impact of the Digital Divide on Management and Policy
Determinants and Implications of Unequal Access to Information Technology

It is widely presumed that universal access to information technology (IT) would bring about a global community of interaction, commerce, and learning resulting in higher standards of living and improved social welfare. However, during the 1990s researchers and policy experts began debating the existence of a “digital divide” between those with access and those without access to IT. After a decade of debate by experts in public policy, communications, philosophy, business management and economics there still is no consensus on the definition, extent, or even the existence of the digital divide. While this issue has been addressed in many contexts, there has been little attention given to the impact of the digital divide on management strategies and policy formulation.

Purpose of the Symposium

For those in the management and policy communities, the existence of the digital divide should have a profound impact on how firms compete globally, the creation of the information age organization, and the diffusion of online commerce, strategies for offering online services, and policies for promoting access to IT and the Internet. Recent research within the academic community indicates that the digital divide can be identified at three levels:

- National Level – while some countries have invested heavily in IT and adopted policies to promote corporate and individual adoption, other countries are being left behind technologically, and may never be able to catch up to their neighbors;
- Organizational Level – some organizations use IT to gain advantage over their rivals and redefine the rules of engagement within their industry, while others lag behind as technological followers putting themselves at a strategic disadvantage; and
- Household Level – those who are technologically, sociologically, or economically disadvantaged may lack or forgo access to IT creating a gap between themselves and those who choose to make IT an integral part of their daily life.

The MISRC/CRITO/DTC Symposium on the Digital Divide will bring together researchers and scholars who are studying the contributing factors and the business implications of these issues to engage in a dialog that will promote further research in the area. The two-day event will allow researchers to present their research findings, receive feedback from symposium participants, and interact with an expert research panel to debate the key managerial and business issues related to the digital divide.

Event Location and Sponsors

The event will be held at the Executive Development Center of the Carlson School of Management, 321 19th Ave S, Minneapolis, MN 55455 on the University of Minnesota campus. The EDC is located on the second floor of the CSOM building. The Symposium on the Digital Divide is sponsored by the MIS Research Center at the Carlson School of Management of the University of Minnesota, the Center for Research on Information Technology in Organizations at the University of California, Irvine, and the Digital Technology Center at the University of Minnesota. Further information is available at the www.misrc.umn.edu/symposia/dd.

“Is there a Global Digital Divide for Digital Wireless Phone Technologies?”

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ABSTRACT

Despite the widespread adoption of new information technologies, a “digital divide” still exists, excluding many from enjoying the benefits, especially those who live in developing countries. A digital divide is defined as an access gap that is measured by the disparities in *subscriber penetration* levels and *technological gaps* reflected in technological discrepancies between countries and regions. However, the rapidly advancing diffusion of digital wireless technologies offers hope that this gap will be diminished. Digital wireless phones, with their popularity, affordability, and fast infrastructure implementation, have great potential to bridge the gap between the “haves” and “have-nots” in support of individual communication. This research reflects an initial effort to study digital wireless phone adoption among nations and regions that will help to provide a picture of the current global digital divide. The questions we address in this research are: (1) To what extent is there a global digital divide with respect to digital wireless phone technology? (2) Are there any observable patterns of the divide relative to the adoption of digital wireless phones among regions and countries in the world? (3) How can we explain what we observe? The data consist of forty three countries in Africa, Asia Pacific, Middle East, North America, South Asia and Western Europe. Our findings are supported by a descriptive analysis of diffusion patterns, as well as a panel data model-based analysis that offers an explanation of the observed patterns. We also present a new theoretical perspective to understand what we see: a *regional contagion theory of technology diffusion*. We examine the efficacy of the new theory using a *vector autoregression* and *variance decomposition* approach to establish information about the strength of the regional contagion links. These findings provide insights for policy makers to understand how to address the access gaps in digital wireless phones on a global basis.

“How Do Industry Features Influence the Role of Location on Internet Adoption?”

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ABSTRACT

We provide a framework and evidence to confront two questions: Does the location of an establishment shape its adoption of different complex Internet applications even when controlling for an industry’s features? If location does matter, what features in an industry shape whether Internet adoption follows a pattern consistent with urban leadership theory or global village theory? Our findings show that both industry and location play a significant role in explaining the geographic variance in adoption. We also find that industries differ in their sensitivity to location. Information technology–*using* industries are more sensitive than are information technology–*producing* industries to declines in both costs and gross benefits as location size changes. Moreover, industries with high labor costs and those that are geographically concentrated are more sensitive to changes in gross benefits that occur with increases in location size.

Measurement and Determinants of the Global Digital Divide

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ABSTRACT

This paper studies the country-level Digital Divide across successive generations of IT, providing detailed insights into the magnitude and changing nature of the Divide. We examine a panel of 54 countries over the years 1985-2001, based on data from three distinct generations of IT: mainframes, personal computers, and Internet users. Using two measures of relative IT penetration, we find that the Divide is narrowing over time and across successive technology generations. We then conduct an empirical investigation of socio-economic factors driving the Digital Divide. We find that IT penetration is positively associated with national income, for all three technology generations, and the association between penetration and income is stronger for countries farther down the development path. We also examine other demographic and economic factors, going beyond income, and find significant differences in the nature of their effects, on different sides of the divide.

“Private Transactions in Public Places: An Exploratory Study of a Public Computer Environment on Transaction Website Use”

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ABSTRACT

Organizations and governments continue to progress toward using electronic means to interact with their customers, however the use of this medium presents an access to service issue for people across the digital divide who do not have internet access from their homes. The computing and internet resources available in public libraries are a source of public access, however a question arises, are people willing to complete information and monetary transactions in that environment. The impact of the physical and virtual facilitating conditions in public libraries on the transactional use of websites is investigated, moderated by the individual need for privacy. The results indicate that virtual and physical facilitating conditions do impact transactional computer use in a public environment; individual need for privacy moderates the impact of task privacy and anonymity on usage in this environment.

How Global Connections Help Diffuse the Internet

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ABSTRACT

The growing perception that the Internet/WWW is becoming a new, powerful engine of global economic and social change has inspired both governments and intergovernmental agencies to accelerate the diffusion of the Internet around the globe via multimillion dollar programs and initiatives. Unfortunately, few empirical studies guide these initiatives. The purpose of this research is to investigate the causes that drive Internet capacity, with special emphasis on diffusion theory. Global diffusion of IT requires some degree of structural homophily (similarities between developed and developing countries in economic, political and social structures) as well as contact with developed countries. In our pooled time-series models of 77 developing nations over the 1995 – 2000 time period, we find that both structural conduciveness (i.e., teledensity, service economies, political openness, and global urban share) and globalization (i.e., aid share, tourist share, foreign investment share, and trade share) shape the distribution and growth of Internet usage.

Leverage Points for Addressing Digital Inequality: Comparing Under-Privileged Adopters and Non-Adopters of High Speed Internet TV

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ABSTRACT

Digital inequality has emerged as one of the most critical issues in the knowledge economy. The unequal access and use of information communication technologies (ICT) inhibits under-privileged people from preparing themselves for opportunities in the digital world. Although government and private organizations have actively engaged with this issue and devoted considerable resources, the consequences are inconclusive. A theory-based empirical evaluation of the phenomenon is essential for effective policy-making and intervention. The context of the field study is the “Free Internet TV” initiative in the city of LaGrange, Georgia, which provided high-speed Internet access to every household via cable TV at no additional cost. This research investigates under-privileged residents’ innovation behavior through the lens of Theory of Planned Behavior (TPB), which concentrates on Attitudes, Subjective Norms, and Perceived Behavioral Control, as explanatory factors of behavioral intention. Exposure to Innovation and Trust in Government are included as additional factors to elaborate the theoretical focus of TPB. The research focuses on a comparison of the behavioral models that characterize under-privileged adopters and non-adopters’ innovation decisions. The results advance the theoretical understanding of the digital inequality phenomenon, enrich the body of knowledge of adoption of innovation, and identify leverage points for policy-makers devising interventions to address the inequality.

Internet Exchanges for Used Books: An Empirical Analysis of Welfare Implications and Policy Issues

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ABSTRACT

Electronic exchanges have enhanced the viability of secondary markets including markets for used books. Online used book markets offer a wider selection, lower search costs, and significantly lower prices than physical used bookstores do. The increased viability of online used book markets has caused concern among groups such as the Book Publishers Association and Author's Guild who believe that used book markets will significantly cannibalize new book sales.

These propositions, while theoretically possible, are based on speculations as opposed to empirical evidence. In this research, we use a unique dataset collected from Amazon.com's new and used marketplaces to estimate the impact of online used books markets on new book sales.

Our analysis suggests that only 15% of used book sales at Amazon cannibalize new book purchases. The remaining 85% of used book sales apparently would not have occurred at Amazon's new book prices. This low cannibalization means that book publishers lose approximately \$32 million in gross profit (about 0.2% of total gross profit) from the presence of Amazon's used book markets, while Amazon's net revenues increase by \$64.1 million dollars. Finally, consumer surplus increases by approximately \$70.2 million. Thus, we find that the first-order impact of the availability of electronic used-book exchange markets at Amazon on total welfare is positive. Further, additional used book readership may mitigate author losses through increased revenue from secondary sources such as speaking and licensing fees.