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## Orange County Executive Survey Finds Internet Contributing to Productivity

The recently released 16th Annual Orange County Executive Survey (OCES), offers a snapshot of technology use in companies in the communities surrounding UC Irvine. In the survey, 300 companies were questioned about their use of technology and their forecasts for hiring, sales and growth in the coming year. Companies in the Manufacturing, Retail, Wholesale, Professional Services, Business Services, Finance, Real Estate and Insurance sectors were surveyed.

### Internet and E-Commerce Use.

The survey finds that use of the Internet for diverse reasons, continues to rise. The Internet's use for product sales and payment processing is on the rise to 46%. In the retail sector, the figure rises to 70%. However, the burst of the Internet as a pop culture icon has caused a dramatic drop in the perception of Internet sales as a primary channel. The number of companies expecting the Internet to "command a significant part of market share" fell by two-thirds to 20% from 60% last year.

"It may be that firms experimented with online sales and found it wasn't adding up to much, so they've lowered their expectations for the future," said Dennis Aigner, professor of economics at UC Irvine's Graduate School of Management and director of the survey. "The dot-com bust has also no doubt influenced how executives feel about prospects for online sales."

Last year, the OCES initiated a set of questions intended to look at the diffusion of e-commerce activities, present and future, within Orange County firms. Within the 87% of firms that use the Internet for commercial purposes, 73% of them primarily use it for business-to-business activities while 27% primarily use it for business-to-consumer activities. In the future, 54% anticipate they will be engaged in business-to-business activities primarily, with 20% using the Internet primarily for business-to-consumer purposes. Twenty-six percent expect approximately equal levels of activity.

### Source of Cost Reduction and Improvements

Inventory costs have, on balance, been reduced through Internet usage, especially in the Manufacturing and Wholesale Trade sectors, with 11% of firms reporting reductions and 4% reporting cost increases. The needs for additional office and warehouse space are close to being counter-balanced. More "just-in-time" product delivery means less warehouse space is needed for inventory, even to support much higher sales. Likewise, more employees telecommuting reduces the need for office space.

The Internet has been a significant source of business innovation. Fifty-five percent of the firms indicated that Internet usage has spurred new best practices or business procedures. Business Services have been most affected while Manufacturing has been least affected (67% vs. 44%).

In other news, the survey shows a strong financial forecast, with two-thirds of executives anticipating better results in 2002 than last year and only 5 percent expecting a decline in financial performance. However, executives overall report modest plans for expansion and employment growth this year, and many firms-particularly those in manufacturing-are struggling with the shortage of affordable housing for employees and the high cost of doing business in Orange County.

The Orange County Executive Survey is sponsored by the Lester L. Kilpatrick/CalComp Endowment, along with the City of Irvine, City of Santa Ana, County of Orange, Orange County Register and Urban Land Institute, Orange County District Council. Dr. Debora Dunkle, CRITO Research Associate worked on the study with Dennis Aigner.

## U.S. Department of Defense Joins the CRITO Consortium

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The U.S. Department of Defense, Office of Force Transformation has joined the CRITO Consortium. John Garstka, Force Transformation's Assistant Director for Concepts and Operations, will act as lead representative to the Consortium. Mr. Garstka, who is based in Arlington, Virginia, is the co-author of *Network Centric Warfare: Developing and Leveraging Information Superiority and Understanding Information Age Warfare* (available at [www.dodccrp.org](http://www.dodccrp.org)).

A key goal of the Department of Defense's (DoD's) ongoing transformation from the Industrial Age to Information Age is the implementation of network-centric warfare. Broadly speaking, network-centric warfare is concerned with effectively leveraging the power of information technology to significantly improve the effectiveness and efficiency of military operations. The DoD's goals with respect to leveraging information technology are closely aligned with CRITO's research agenda, which broadly addresses how information technology can be leveraged by organizations to increase competitive advantage.

The Office of Force Transformation is interested in a number of CRITO research areas including returns on information

technology investments and a potential study on the impact of new communication technologies on the morale of forward deployed military forces and their families.

According to Garstka, "An important research topic to be addressed is the extent to which email, for example on board ships, increases the morale of Navy personnel and their families and aids retention. This is significant because the cost of recruitment and training of new personnel is considerable and an improvement in retention rates could more than outweigh the costs of providing this capability, to say nothing of the benefits of increased morale."

CRITO Director, Ken Kraemer stated, "We are very excited about the new avenues of research and fresh perspectives that the Department of Defense brings to the Consortium. We look forward to a long and fruitful partnership. Military settings provide an interesting opportunity to study the social, economic and managerial impacts of technology in a context that is totally new to us."

For more information on the CRITO Consortium, contact Karen Walsh at (949) 824-1323 or [kmwalsh@uci.edu](mailto:kmwalsh@uci.edu).

## CRITO in the News

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*CRITO in the News is appearing for the first time in the newsletter. This section highlights excerpts about CRITO and our work that have appeared recently in the media.*

Surveying the Impact of IT on Local Economies, "Perhaps the greatest benefit to a local economy from IT comes from overall improved worker productivity. While productivity statistics really don't exist for such intangibles as competitive advantage, faster business cycles or improved service levels for citizens, a comprehensive review of scores of individual studies conducted last year by **Jason Dedrick, Vijay Gurbaxani** and **Kenneth Kraemer** of the University of California, Irvine, makes it clear that there is some tangible positive impact on local economies from IT. In one study, IT investments appeared to improve labor productivity to the point that it accounted for 28 percent of growth in GDP."

**Excerpt from The Worldpaper, April 24, 2002.**

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"**Alladi Venkatesh**, of UC Irvine, looks at the results, rather than the roots, of the digital revolution: using ethnographic research techniques to study the impact of home networks and highly-wired communities on family life. For his research, he has focused on a housing development called Ladera Ranch in southern Orange County, where homes have "IT nooks", high-speed Internet access and the entire community of 2000 homes is interlinked with a common intranet. 'Unlike other appliances,' he notes, 'Americans haven't yet figured out which room in the house the computer belongs in. This will be a very important time to study.'"

**Excerpt from "Cyber Scholars: C++ Meets Chaucer as Universities Begin to Study the Digital World", Michael Rogers, [www.msnbc.com](http://www.msnbc.com), May 14, 2002.**

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"In spite of the bad moments there is confidence that the Internet will not lose money forever, not even if we consider the current situation of the economic market.

In Mexico the tendencies show that the foundation established during 1999 and 2000, and the interest of private and public institutions to digitalize their processes, are maintaining the flame of the Internet as a business model.

The Center for Research on Information Technology and Organizations (CRITO) of the University of California, affirms that another contributing factor is the entrepreneur spirit of the current Mexican government that is strongly motivating companies to digitalize their processes.

In the study titled "Global E-Commerce Survey: Report of Results Overall and by Industry Sector", CRITO highlights the efforts that the IMSS (Mexican Social Security Agency) or the CONSAR (National Commission for Savings and Retirement) have done to encourage and push their clients and providers to use the Internet."

**Excerpt from July 9, 2002 edition of Mexican newspaper, El Universal, "Optimism Prevails for Electronic Commerce in Mexico" by Nelly Acosta Vázquez.**

## Recent Publications

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A new research paper, co-authored by Professors **Kevin Zhu** and **Ken Kraemer**, has recently been accepted for publication by Information Systems Research (ISR). The paper is titled "E-Commerce Metrics for Net-Enhanced Organizations: Assessing the Value of E-Commerce to Firm Performance in the Manufacturing Sector," which is to be published in ISR's special issue on e-commerce in September, 2002. ISR is widely recognized as the most prestigious academic journal in the field of information systems. Its upcoming special issue received more than 80 submissions, involved 240 reviewers, and caught significant attention across the information systems field worldwide. Zhu and Kraemer's paper survived a rigorous review process to be accepted for the publication.

In this paper, Zhu and Kraemer developed a set of instruments to measure e-commerce capability in Internet-enhanced organizations. The e-commerce capability metrics consist of four dimensions - information, transaction, customization, and supplier connection. These measures were rigorously validated for reliability and validity. Then they examined their relationships to firm performance, with data from 260 manufacturing companies divided into high IT-intensity and low IT-intensity sectors. After controlling for variations of industry effects and firm size, their empirical analysis found a significant relationship between e-commerce capability and firm performance measure (especially, inventory turnover), indicating that the proposed metrics have demonstrated value for capturing e-commerce effects.

Their analysis also showed that e-commerce tends to be associated with increased cost of goods sold for traditional manufacturing companies, but an opposite relationship for technology companies. This result highlights the role of resource complementarity for the business value of e-commerce - traditional companies need enhanced alignment between e-commerce capability and their existing business processes and IT infrastructure in order to make their investments in e-commerce more productive.

This is one of the first studies to provide systematic empirical evidence on the "Internet effect" at the firm level, and it is the first time that a rich database on a large number of manufacturing companies has been assembled for assessing business value of e-commerce.

**Mark Bergman, John L. King and Kalle Lyytinen** (professor at Case Western Reserve University) had "Large Scale Requirements Analysis as Heterogeneous Engineering" accepted for publication in the Scandinavian Journal of Information Systems. They also had "Large Scale Requirements Analysis. Revisited: The need for Understanding the Political Ecology of Requirements Engineering" accepted for publication in the Requirements Engineering Journal.

Gurbaxani, V., Kraemer, K. and Dedrick, J. (2002). Measuring IT Value: What the Numbers Say. CSC World, Spring/Summer 2002. This paper summarizes the findings of the extensive survey of the economics and IT literature on the payoffs from IT investments. It concludes there is strong

consensus among economists that IT investment pays off in higher productivity, and that IT investment was a significant source of economic growth in the second half of the 1990s. The paper concludes that there are sound reasons for expecting IT to continue to enhance productivity. First is the direct positive impact of IT on labor productivity and second is the continuing role of IT as an enabler of more efficient business organizations.

Tallon, P.P. and K.L. Kraemer (2002) "Investigating the Relationship between Strategic Alignment and IT Business Value: The Discovery of a Paradox" in *Creating Business Value with Information Technology: Challenges and Solutions*, N. Shin (editor), Idea Group Publishing: Harrisburg, PA. While closer alignment between information technology (IT) and the business strategy can lead to improved payoffs from IT investment, this study finds that for a small number of firm, closer alignment can conflict with the need to retain strategic flexibility in turbulent environments and could, paradoxically, lead to lower payoffs from IT if remedial steps are not taken.

## Technology in the Home Study Beginning in Local High-Tech Community

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### *Study is already gaining national attention*

CRITO Associate, Alladi Venkatesh, is starting a survey in Orange County's most tech-forward planned community, Ladera Ranch. As part of Project NOAH, sponsored by the National Science Foundation and a grant from the CRITO Consortium, Venkatesh will study how computers and other home-based technologies are being used in the home and their impact on people's lives.

Ladera Ranch, located in southern Orange County, is a master-planned community that is slated to have more than 8,000 homes at build out. Every residence is equipped with Category 5 cable wiring with ports throughout the home. Cable modem service, provided by Cox Communications, is included in monthly homeowner's association dues and modem equipment is leased without charge. The community has an active Intranet site for residents and a high-tech sales center that features video walls with images of future retail centers and parks. Information is available at <http://www.laderaranch.com>.

Venkatesh will compare results with those found in other areas throughout Southern California as part of the ongoing study. The project already received national attention on Newsweek/MSNBC online in May.

For more information or spin-off studies, contact Alladi Venkatesh at (949) 824-1134 or [avenkate@uci.edu](mailto:avenkate@uci.edu) or visit the Project NOAH web site at <http://www.crito.uci.edu/noah>.

## CRITO Briefs

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On June 9th, the **Paul Gray** PC Museum opened at Claremont Graduate University. The museum's mission is to preserve the history and development of the Personal Computer. The Museum also has a web site: <http://is.cgu.edu/pcmuseum>, which shows the equipment exhibited and the extent of the collection. PC equipment dating back to 1979, including hardware and software, can be seen at the museum. Gray is a Visiting Professor at UC Irvine and is affiliated with CRITO.

**Ken Kraemer** gave a talk on the determinants of information and communication technology spending at a conference called The New Economy in Development, put on by the World Institute for Development Economics Research (WIDER) in Helsinki, Finland in May.

**Mark Bergman** and **Martin G. Buehler** (from the Jet Propulsion Laboratory) presented in March, 2002 "Analysis of the New Millennium Program (NMP) Flight Validation Process Using Process Type Analysis Method (PTAM) at the IEEE Aerospace 2002 Conference in Big Sky, MT. This paper discusses a process analysis method developed during field research on at the Jet Propulsion Laboratory.

**Gloria Mark** and **Alfred Kobsa** attended IV-02 (Information Visualization 02) July 10-12 to present work on an experiment conducted at the CRITO groupware lab on collaborative vs. information visualization.

**Gloria Mark** and Ph.D. student, **Mark Bergman** presented in June, 2002 "Technology Choice as a First Step in Design: The Interplay of Procedural and Sensemaking Processes" at the ACM (Association for Computing Machinery) Design of Interactive System (DIS) 2002 conference in London, UK. This paper examines the use of sensemaking in performing technology and project selection at the beginning stages of design.

**Gloria Mark** and **Mark Bergman** had the paper entitled "Exploring the Relationship between Project Selection and Requirements Analysis: An Empirical Study of the New Millennium Program" accepted to the IEEE Requirements Engineering (RE) 2002 conference in Essen, Germany. They will present the paper in the conference in September, 2002.

In January, 2002, **Mark Bergman** presented an overview of his research entitled "Of 'Garbage Cans' and Requirements" at the Human-Computer Interface Consortium (HCIC) at Fraser, Colorado.

CRITO associates **Paul Dourish**, **Alfred Kobsa** and **Gloria Mark**, along with **Andre van der Koek**, **Debra Richardson** and Principal Investigator, **Dick Taylor**, have received a \$1.8 million grant to study distributed software development environments.

**Gloria Mark** and Ph.D. student, **Victor Gonzalez** went to France at the beginning of June to attend and present research findings at COOP 2002 - The International Conference on the design of Cooperative Systems. She also attended Collaborative information visualization conference in mid-July in London to present work from the groupware lab. Finally, she attended and presented research findings at the CHI 2002 Conference on ACM in April.

### Knowledge Group Conference Held at CRITO

Scholars are now recognizing that managing knowledge is much more challenging than both our academic and practitioner frameworks have allowed. The 2002 UCI/MIT Knowledge in Organizations Conference sponsored by UCI Graduate School of Management, MIT Sloan School of Management and CRITO was organized to make progress on identifying the key theoretical and empirical challenges for examining the role of knowledge in organizations and outline research agendas to deal with them. The conference was organized by **David Obstfeld** (UCI GSM), **Paul Carlile** (MIT), and **Yrjo Engestrom** (UC-SD) and was attended by a number of leading scholars in organizational knowledge including **Paul Adler** (USC), **Beth Bechky** (UC-Davis), **John Seeley Brown** (Xerox Palo Alto Research Center), **Michael Cohen** (University of Michigan), **Deborah Dougherty** (Rutgers), **Paul Dourish** (UCI), **Alaka Rao** (UCI), **Andrew Hargadon** (UC-Davis), **Jean Lave** (UC-Berkeley), **Sim Sitkin** (Duke), and **Sid Winter** (Wharton). The conference was held on May 31 and June 1 at CRITO. **Gloria Mark** and **Alladi Venkatesh** represented CRITO.

**WANT TO LEARN MORE?** As a benefit of membership in the CRITO Consortium, CRITO Faculty Associates will travel to member companies' sites to present their subject to your audience. For more information or to request a talk, please contact Karen Walsh at (949) 824-1323 or [kmwalsh@uci.edu](mailto:kmwalsh@uci.edu).

## CRITO Updates

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### Distinguished Researcher Alain Pinsonneault Coming to CRITO

**Dr. Alain Pinsonneault** will be joining CRITO in September as a visiting researcher for the 2002-2003 academic year. Dr. Pinsonneault is the Imasco Professor (in honour of Paul Paré) of Information Systems in the Faculty of Management at McGill University. Prior to joining McGill University in June 1999, he was an Associate Professor at the École des Hautes Études Commerciales (Montreal) and the Director of the Ph.D. program. He obtained his Ph.D in IS in 1990 at UC Irvine.

His dissertation won the Doctoral Award of the International Center for Information Technology and MCI Communications. He was named the Person of the Week by La Presse newspaper in 1991 in Québec. In 1993 he was named the most promising HEC graduate by the alumni, and in 1995, he won the Gaëtan Morin Award as the most promising young researcher at HEC. In 1997, he was awarded the CDROM-SNI Award for the best pedagogical material that used information technology at HEC.

His current research interests include the organizational and individual impacts of information technology, electronic commerce, the strategic alignment of information technology, group support systems and IT department management. He has published papers in Management Science, Management Information Systems Quarterly, Information Systems Research, Organization Science, Small Group Research, The Journal of Management Information Systems, Decision Support Systems, and the European Journal of Operational Research.

### Jinwoo Kim Arrives from South Korea

Visiting Associate Professor **Jinwoo Kim** from Yonsei University in Seoul, Korea has arrived. He will be working with Alfred Kobsa, an UC Irvine ICS faculty member, until the summer of 2003.

Dr. Kim carries out empirical research on the adoption and usage of information technology, such as mobile Internet devices, Internet TV, cyber stores and cyber banks, and decision support systems. Further information about his work can be found at <http://hci.yonsei.ac.kr/~jinwoo/>

Dr. Kim will work with Dr. Kobsa in a CRITO-funded project on the identification of success factors in the adoption of information visualization systems, and the evaluation of personalized mobile devices. He can be reached in Room 100 in ICS 2 or through email at [kim@ics.uci.edu](mailto:kim@ics.uci.edu).

### CRITO Staff News

Congratulations to CRITO webmaster **Carolyn Davidson** and her husband Chris! Their first child, Troy Malin Davidson, was born May 27.

Best wishes to CRITO Ph.D./postdoc. **Erin Bradner**. After six fruitful years, Erin is leaving UCI to take a position as Senior Usability Engineer at Autodesk. She will be helping to improve the design of AutoCAD as well as helping design their web-based collaborative workspace for customers to manage all manner of CAD projects.

### Welcome to Two New CRITO Employees

**Lisbeth Ruiz**, CRITO's new Executive Assistant to the Director. Lis provides executive-level administrative support to Kenneth Kraemer. Her responsibilities include: coordinating activities on research projects; editing and producing final versions of manuscripts for publications, research proposals, and correspondence; handling the director's calendar and other support activities. Lis comes to CRITO from Tennessee Board of Regents and Tennessee State University. Lis received her bachelor of journalism from the University of Missouri-Columbia School of Journalism.



**Lauri Newell**, CRITO's new Financial Analyst. Lauri's responsibilities include grant administration, fiscal management of all federal and private extramural funding, personnel/payroll policies and procedures. Previously, Lauri worked at UC Irvine's College of Medicine.



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## Upcoming CRITO Events

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### CRITO Hours

Tuesday, September 10. **Tom Horan**, Executive Director of the Claremont Information and Technology Institute at Claremont Graduate University. "Mobile Wireless Networks: New Challenges to Public-Private Management and Partnerships".

Wednesday, September 25. **Sharad Mehrotra**, Associate Professor, Information & Computer Sciences, University of California at Irvine.

Wednesday, November 20. **Linda Cohen**, Professor and Chair, Economics, University of California at Irvine.

### CRITO HOURS



CRITO Hour seminars are free and open to the public. At 11:45 lunch is available, the guest speaker begins at noon and the seminars end at 12:50. All sessions take place in the CRITO Conference Room at 3200 Berkeley Place. Visit [www.crito.uci.edu](http://www.crito.uci.edu) in the fall to see an updated schedule of CRITO Hours. Contact Anita Amabile at (949) 824-5768 or [aamabile@uci.edu](mailto:aamabile@uci.edu) for additional information.

### Home of the Future Conference

CRITO is pleased to announce a three-day international conference on the Networked Home and the Home of the Future. The conference is co-sponsored by CRITO and the International Federation for Information Processing's (IFIP) working group on Home Technology Working Group. The conference dates are April 6-8, 2003. The purpose of the conference is to present papers, exchange ideas between and among researchers from different disciplines relating to the impact of new technologies on family/work life and the developments concerning the future of the networked home. The participants will include researchers and specialists from Universities, Research Organizations, Industry and Government. Look for more information in the next issue of the newsletter.



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