

**Proceedings**

# **ISECON 2000**

**Information Systems Education Conference**

**Let Liberty Ring:  
Learning from the Past and  
Applying it to the Future of  
IS Education**

Adam's Mark Hotel  
Philadelphia, Pennsylvania USA  
November 9--12, 2000

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AITP: The Association of Information Technology Professionals



Foundation for  
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ISECON 2000 is the seventeenth in an annual series of international conferences devoted to education in the field of Information Technology. Conferences such as this are possible only because of the continuing interest and support of the Information Systems educational community, expressed by their submission of high-quality papers and their attendance at the conference. The ISECON 2000 Conference Committee and sponsors gratefully acknowledge all the authors, session chairs, and other participants for contributing to the success of this conference.

ISECON (the Information Systems Education Conference) is sponsored by the Foundation for Information Technology Education. Additional support is provided by EDSIG (the AITP Special Interest Group for Education) and AITP (the Association for Information Technology Professionals). The conference has also received extensive support from the School of Computer Science and Information Systems at Pace University and the School of Computer and Information Sciences at the University of South Alabama.



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# ISECON 2000

## Philadelphia

*WELCOME TO ISECON 2000*

### THE SEVENTEENTH ANNUAL CONFERENCE FOR INFORMATION SYSTEMS EDUCATORS

Dear Colleagues:

This year brings the ISECON Conference to the northeast and historic Philadelphia for the first time. This is most apropos as we enter a new millennium – we break new ground while reflecting on the accomplishments of the past to inform future practice. When the first ISECON was held in Chicago in 1982, few colleges and universities offered programs in Information System. Now hardly a school fails to offer one, although under many names and of many flavors.

In this year's ISECON Proceedings — the first to be in CD format with an accompanying Abstract Proceedings — you will find 144 entries including 126 refereed papers, 11 workshops, and 7 panels. Included among the works are representatives of eight countries from five continents.

None of this would have been possible without the outstanding effort put forth by this year's ISECON 2000 Organizing Committee. The sun hardly set on the Committee, as team members conducted their work from Great Britain to Hawaii and a dozen places in between. I must single out this year's Proceedings team, Dr. Judy Caouette and Dr. Bel Raggad from Pace University, our Papers Co-Chairs, and Dr. Don Colton from Brigham Young University--Hawaii Campus, our Proceedings Chair, for the wonderful job that they have done. In particular, Don has shown imaginative leadership in guiding us into new territory with this year's proceedings.

And the support and guidance of the Education Foundation through this year's President, Dr. Brian Reithel and Director, William Reaugh, has been very helpful. Just as instrumental has been the work and support of the EDSIG Board and its President, Dr. William Tastle. Also, the work of the folks at the University of South Alabama under the leadership of EDSIG Vice President, Dr. David Feinstein, has been indispensable.

Finally, it is with much gratitude and appreciation that I recognize the encouragement and very tangible support of Pace University and its School of Computer Science and Information Systems under the leadership of Dr. Susan M. Merritt.

Stuart A. Varden  
Pace University  
ISECON 2000 Conference Chair

# ISECON 2000

## Philadelphia

Welcome to the only information systems-specific conference in the Western Hemisphere...and perhaps the world! As educators we are challenged with a continuingly need to update skills, learn new methods of problem solving, master new paradigms in our spare time, continually learn the ever-present software updates that are without end, and to pass on that complex knowledge and skill with almost the snap of a finger. We have dedicated ourselves to a discipline that has us reformulating academic courses as a matter of course, and incurring the wrath of curriculum committees that ask us when our discipline will become stable - like foreign language, history, or mathematics. It seems that we are continually re-inventing ourselves, our courses, and our entire curricula. With each minute of time we apply to our discipline, that is one more minute we steal from our families and personal life. We are, indeed, living in interesting times.

The purpose of the Association of Information Technology Professionals, Special Interest Group on Education, or EDSIG as we have become known, is to bring together educators who share in this demanding profession to discuss curricula, discover new methods of teaching that others have developed, learn new (and old) problem solving methods, be introduced to new software programs, and become a part of a nation-wide support system of educators. As a member of EDSIG you have an opportunity to become as active in this organization as you desire, perhaps eventually becoming a member of the Board of Directors. The Bylaws of this organization have been designed to specifically limit the number of years any single individual can be on the Board, for we believe that in order for one to bring one's talents to bear in furthering one's discipline through a national organization, an opportunity must exist by which all have an opportunity to lead. If you seek to become active in molding the future of IS education, then please consider making your desire known to any member of the Board of Directors.

Lastly, we are privileged to be here in Philadelphia participating in this wonderful conference. I stand with the Board of Directors of EDSIG in congratulating Dr. Stuart Varden and his team for producing a truly memorable conference. Stuart, well done! You are a remarkable man and we are most fortunate to have you as our conference chair.

William J. Tastle, PhD  
President, AITP-EDSIG



## ***Foundation for Information Technology Education***

Dear Colleague:

A little more than a year ago, I had the opportunity to visit with this year's ISECON Conference Chair, Dr. Stuart Varden, and last year's chair, Dr. David Feinstein, to discuss our plans for ISECON 2000. We had just finished holding a successful ISECON event in Chicago and the future looked bright. Today, it is inspiring to reflect back on that hopeful conversation and to review our aspirations for the meeting in Philadelphia. We hoped to increase the quality of the papers, boost the number of participants and leverage the power of the learning experience that ISECON represents for all who attend. As this year's program came together, under Stuart Varden's exceptional and capable leadership, we began to realize that ISECON 2000 would surpass our expectations in every category!

We are thankful to the large team of folks who have worked so hard to bring this event to fruition. In particular, we deeply appreciate the efforts of the many authors, reviewers, presenters, panelists, workshop instructors, keynote speakers and the ever-faithful ISECON Committee members. We are especially indebted to those who have worked to handle local arrangements, logistics, registration, and the myriad assortment of activities needed to make a national conference like ISECON work so smoothly.

Anyone who has ever worked on the production of the proceedings of a conference of this magnitude can offer powerful testimony regarding the sheer scale of the effort. I would like to offer a special note of thanks to Don Colton for his willingness to explore all options to produce this outstanding Proceedings.

Also, on behalf of the Board of Regents of the Foundation for Information Technology Education, I would like to offer our profound gratitude to Stuart Varden and his ISECON team: Denise McGinnis and Neelima Bhatnagar, Program Co-Chairs; Judy Caouette and Bel Raggad, Papers Co-Chairs; Don Colton, Proceedings; David Zolzer, Registration; Margaret Thomas, Vendors Chair; Joseph Daniel and James Dutt, Local Arrangements; William Reaugh, EF Representative; Buzz Hensel, Awards; and Bruce White, ISECON Web Page.

The Foundation for Information Technology Education exists to advance the state of education and practice in the Information Technology profession. We are fortunate to have the Education Special Interest Group (EDSIG) of the Association of Information Technology Professionals (AITP) as our partner in developing the ISECON meeting each year. Through this meeting, we hope to offer a forum in which information technology educators can come together, learn, and return home to the classroom to shape the skills, knowledge and character of tomorrow's information technology professionals.

We hope that you find ISECON 2000 to be a valuable networking and professional development experience. We also hope that you will make plans to join us in the future at ISECON 2001 and beyond.

Sincerely,

Brian J. Reithel, Ph.D., CDP  
President  
Foundation for Information Technology Education

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# Educator of the Year 2000

## Paul Gray

Paul Gray is Professor and Founding Chair of Information Science at Claremont Graduate University. Paul was instrumental in bringing one of the thirteen IBM \$2 million grants to Claremont in 1986, which established Claremont as one of the leading academic institutions in information systems.

Starting in 1983, Paul Gray created, developed and built one of the largest PhD producing Information Systems programs in the world. Claremont graduated its first PhD in 1991. Since then, the school has produced 44 PhDs. During the 1990s, Claremont was the largest producer of PhDs in IS in the world, far exceeding the production of both the University of Minnesota and the University of Arizona. The size of the PhD program allows Claremont to offer five required doctoral-only courses in IS each year, which makes the program a true PhD program in IS rather than offering additional masters or MBA courses. At the masters level, Claremont offers one-year and two-year MS in IS degrees as well as an MS in Electronic Commerce. Currently, the Information Science program has 130 graduate students majoring in Information Systems, of whom approximately 50 are PhD students.

By keeping Information Science separate from the Drucker Management Center (Claremont's Business School) he was able to create a School that concentrates only in IS, and is able to offer specialized courses that reflect current trends. For example, this year, courses in ERP, Knowledge Management, Data Warehousing, and Business Intelligence are being offered.

Professor Paul Gray has made outstanding national-level contributions to the field of Information Systems. Paul was co-chair of the joint ACM-AIS Committee on the MSIS degree. The work of this committee, which was published in January 2000, provided the first revision in eighteen years of the standards for the MS degree in IS. It makes the MS

program relevant to the 21st century. He is the first editor of the Communications of AIS and a fellow of the Association for Information Systems. He was president of the Institute of Management Sciences (now INFORMS) for 1992-93, and was formerly president-elect, vice president and secretary of the Institute.

He specializes in decision support systems, knowledge management, electronic commerce and data warehousing. He is on the editorial board of several journals. He is the author of over 115 journal articles and author or editor of 12 books, most recently Decision Support in the Data Warehouse with H.J. Watson.

Professor Gray has both industrial and educational experience. He worked for 18 years in research and development organizations, including nine years at SRI International. He is living proof that you can complete a PhD at Stanford while working full time. Since he completed his PhD in 1968, he has been a professor at a number of Universities including Stanford University, Georgia Institute of Technology, University of Southern California, Southern Methodist University, and, for the last 17 years at Claremont. He served as Department Chair at USC, at SMU, and at Claremont.

---

Year	Educator of the Year
1985	Philip Gensler
1986	Joyce Currie Little
1987	Jerry Wagner
1988 - 1992	None
1993	Gordon Davis
1994	Dan Cougar
1995	Andy Whinston
1996	Milt Jenkins
1997	Jay Nunamaker
1998	Herman "Hoppy" Hoplin
1999	John T. Gorgone
2000	Paul Gray

# ISECON 2000 Distinguished Speakers

## Lead Speaker

### Maryfran Johnson



Maryfran Johnson is the vice president of editorial content for Computerworld.com and editor in chief of Computerworld, the Newspaper for IT Leaders, with a nationwide circulation of 250,000 business and information technology professionals. She joined Computerworld in 1989, after eight years as a reporter at daily newspa-

pers in Florida, Washington state and Ohio. In her first position as a technology reporter at Computerworld, she covered a variety of beats including IBM and HP midrange systems, the Unix industry, and client/server software. She was the founding editor of Computerworld's Client/Server Journal in 1993, and then promoted a year later to News Editor.

In February 1996, she moved to the executive editor role, a position responsible for all newsroom operations and a staff of 65. In her role as Computerworld's top editor, she serves as a technology commentator for radio, TV and newspapers, and is a prominent keynote speaker at industry conferences. Ms. Johnson holds a master's degree in journalism from The Ohio State University, and two bachelor's degrees, one in French Literature from the State University of New York at Albany, and the other in Journalism from the University of Florida.

Title of presentation: IT on the 'Net Frontier: The Leadership Challenge

The rise of the Internet and "e-business" is rapidly transforming the computer industry, as companies begin the transition to an age of pervasive computing and integrated supply chains. Today's IT professionals need to be deeply involved with their companies' business strategies, helping to craft new ways of connecting with customers and creative ways to leverage technology as business models rapidly evolve. On top of all this change, the "dot-com brain drain" is pulling top talent away from traditional companies at an alarming rate. In her talk, Computerworld Editor in Chief Maryfran Johnson will zero in on the leading high-tech trends and their impact on company strategies across all industries.

## Keynote Speaker

### Ben Shneiderman



Ben Shneiderman is a Professor in the Department of Computer Science, Founding Director (1983-2000) of the Human-Computer Interaction Laboratory, and Member of the Institute for Advanced Computer Studies and the Institute for Systems Research, all at the University of Maryland at College Park. He was made a

Fellow of the ACM in 1997, was the Co-Chair of the ACM Policy98 Conference, May 1998, and is the Founding Chair of the ACM Conference on Universal Usability, November 16-17, 2000.

Dr. Shneiderman is the author of *Software Psychology: Human Factors in Computer and Information Systems* (1980) and *Designing the User Interface: Strategies for Effective Human-Computer Interaction* (1987, third edition 1998, booksite), Addison-Wesley Publishers, Reading, MA. His 1989 book, co-authored with Greg Kearsley, *Hypertext Hands-On!*, contains a hypertext version on two disks. He is the originator of the Hyperties hypermedia system, which was produced by Cognetics Corp., Princeton Junction, NJ. In addition he has co-authored two textbooks, edited three technical books, published more than 200 technical papers and book chapters. His most recent work *Readings in Information Visualization: Using Vision to Think* is co-authored with Stu Card and Jock Mackinlay.

Ben Shneiderman has been on the Editorial Advisory Boards of nine journals including the ACM Transactions on Computer- Human Interaction and the ACM Interactions. He edited the Ablex Publishing Co. book series on "Human-Computer Interaction." He has consulted and lectured for many organizations including Apple, AT&T, Citicorp, GE, Honeywell, IBM, Intel, Library of Congress, Microsoft, NASA, NCR, and university research groups.

Title of presentation: "The Future of User Interfaces"

Join us at the Friday evening reception (5:00 to 6:30) following the conference keynote remarks by Dr. Ben Shneiderman where you will have an opportunity to meet informally with Ben and other leaders from industry and the education community. We are grateful to PeopleSoft, Inc., the sponsor of the reception.

# Industry Leader

## Wanda Miles



Wanda Miles is the Director of Education Alliances at Docent, Inc. She is responsible for deploying eLearning solutions into education market place worldwide. She is also responsible for the philanthropic programs at Docent, which

include Docent Scholarships, a Corporate Sponsor Program and the Docent Foundation. Prior to joining Docent, Wanda was the Eastern Regional Manager for the Global Learning Initiatives, at Oracle Corporation. Wanda was the Education Business Development Manager for Sun Microsystems Computer Company before she joined Oracle, where she developed sales programs to support higher education institutions in North America. Wanda was an Academic Alliance Manager in the Educational Multimedia Group at Addison-Wesley Longman before working for Sun Microsystems. Wanda's career in the technology industry includes employment with Apple Computer, Commodore Business Machines, and Honeywell Information Systems. Wanda graduated with honors from the University of Redlands, where she earned a Bachelor of Arts degree in Management. She is a 1997 Leadership California Fellow.

Title of presentation: IT Education: The Need, the Challenge, and the Importance

This session will discuss trends, tools, programs and partnerships with business, government and education that work to meet the challenge to keep pace with technological change and reduce the Digital Divide.

# Distance Learning

## David Sachs



Dr. David Sachs is Assistant Dean and Professor of Office Information Systems in Pace University's School of Computer Science and Information Systems. As Assistant Dean, he has been actively involved in the development and implementation of computer science and telecommunications courses for the corporate community since 1984.

As director of the Pace Computer Learning Center, Dr. Sachs is responsible for the many hundreds of days of personal computer, computer science, and telecommunications that are provided each year to corporations throughout the United States and around the world such as AT&T, IBM, MCI, PepsiCo, The Reader's Digest, Prodigy and others. Dr. Sachs works closely with teachers, administrators and others to think about the most effective ways to introduce technology into public and private schools. Most recently, he has been actively involved in the development of courses to be taught asynchronously over the Internet and the World Wide Web.

Title of presentation: "Critical Success Factors in Distance Learning"

# Luncheon Speaker

## Susan Merritt



Dr. Merritt joined Pace University in 1975. She is now professor of computer science and founding Dean of the School of Computer Science and Information Systems, established in 1983. As dean, she has also led the University's technology planning.

Dr. Merritt received the Ph.D. and the M.S. in computer science from New York University's

Courant Institute. She received the B.A. degree from the Catholic University of America where she was elected to Phi Beta Kappa and from where she graduated summa cum laude. She makes regular contributions to the computing literature and makes presentations in computer science as well as in social, organizational and educational issues related to information technology. She has been active nationally in the Association for Computing Machinery and is now chair of the ACM Distinguished Lecturer program. She is a member of the Computer Science Accreditation Commission and has chaired accreditation visits for more than ten years. She serves on Technical Advisory Boards of the New York State Literacy Volunteers of America, the New York University Multimedia Research Center and the American Red Cross.

Title of presentation: Information Technology: Characterization, Education and Professionalization.

In just the last few years the term "IT" has been used widely, often instead of IS, or CS, for example. This talk will explore what IT is, what it means for education and what it means for practitioners.

# Track: Information Systems Curriculum

## 100 Server-Side Scripting in JavaScript/JScript and VBScript



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When developing server-side scripting using Microsoft's Active Server Pages and their Internet Information Server (IIS), either VBScript or JScript are available. The language of choice for most developers is VBScript since it is closely akin to Visual Basic and Visual Basic for Applications. However, for those developers that are more familiar with Java and JavaScript, JScript is a comfortable alternative. The differences between VBScript and JScript lie primarily in the syntax and not in the functionality. The examples interact with an Oracle database: to connect to the database; create record sets; and adding, changing, and deleting records shows identical logic structure. Where the use of JScript rather than VBScript can become rather tedious is the scarcity of functions in JScript that are available in VBScript. The solution is to write comparable user-defined functions in JScript as demonstrated by the FormatCurrency function.

## 101 Nontraditional Course Development: The Case of the Information Systems Architecture Course



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This paper describes the development of a new information systems course on the topic of information systems architectures. The process by which this course was developed and taught is interesting for two reasons. First, the course topic remains sufficiently new so that few traditional course development resources such as textbooks are available to instructors and hence

other resources need to be sought out. Second, the course was developed to be taught as a distance education course, using two-way satellite-based video and the world wide web as the vehicles for communications and remote instruction. The practical experiences described in this paper may serve as a basis for other instructors on which to base their course preparation efforts.

## 102 A Tutorial: Object-Oriented Programming/C++



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Often the transition from procedural programming to object-oriented programming is painful for many students who have extensive experience in procedural programming with no exposure to object-oriented concepts. In this tutorial I will show how object-oriented programming promotes a new level of abstraction and reusability using inheritance and polymorphism. The C++ is used for presentation.

## 103 Designing Undergraduate and Doctoral Level Programs to Advance the Career Potential of Women in Information Technology

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This paper focuses on the design, innovations and outcomes of undergraduate through doctoral level programs in the information systems field, with a major emphasis on the successful assimilation and enhancement of the career potential of women. Despite expanding opportunities and substantial financial incentives, women are significantly underrepresented at both the collegiate and professional levels of the information sciences. Furthermore, there is much evidence that women experience a cumulative disadvantage, in computer terms, that begins in grade schools, continues through the college years, then subtly manifests itself as



discrimination at the corporate level. Thus, this study examines the effect of the ongoing strategies employed for the integration of women in the computer information system discipline at Robert Morris College and surveys the corporate computing environment of Pittsburgh and Southwestern Pennsylvania. The issue of discrimination against women in corporate information technology departments is raised, along with the strategies used to combat such practices. Finally, the Robert Morris doctoral program initiatives are employed to address these problems and integrate them into the curriculum.

### **104 Transition to Four Credit Courses: Orderly or Chaotic**

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Marist College is an accredited institution with a three-credit per course system. The concept of making four-credit courses the standard has been discussed informally for many years by both faculty and administration. In spring 1996, an ad-hoc committee was created to study the feasibility of such a change. The committee did not make a recommendation but focused on the difficulty such a change would entail and the lack of enthusiasm at several institutions that had experienced such a transition. In 1998, a second ad-hoc committee was established to more fully investigate a transition to four-credit courses. The committee was charged to consider the impact on several factors, such as, majors and academic programs, transfer courses, contact hours, staffing, and graduate courses, just to name a few. After one and a half years, the committee developed a discussion document to elicit responses and suggestions from each school. This paper is the author's response for the committee detailing the impact the transition would have on the information systems program, specifically, the Information Systems discipline, and Information Systems majors.

### **105 Programming I and II Using C++ for Beginning IS Students**



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This paper describes the topics and objectives for a two-semester sequence, Programming I and II using the C++ language, for beginning students majoring in 2-year and 4-year IS programs. The paper explores the recent advances in the field of programming and how to incorporate these into the undergraduate IS curriculum. Object-oriented programming, object-oriented analysis and design, generic programming using STL, the necessary topics in data structures, and algorithms and their complexity required to understand STL are also explored.

### **106 Information-Oriented Technology Curriculum Design and Development: The Need for a Paradigm Shift**



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Developing information systems curriculum has been a topic of discussion by information system educators and industry practitioners for many years. While the demand for information systems professionals continues to increase, the dynamic nature of the field will continue to challenge information systems educators to be creative and innovative in their approaches to curriculum development. The proposed paradigm attempts to accentuate the planning and the implementation of academic programs that require computing and communications technologies, and is oriented to the new breed of students. This paradigm has been utilized as a framework in developing information systems programs at several academic institutions. The paradigm encapsulates five common components that are considered to be effective for curriculum development in information systems (curriculum development, curriculum contents faculty, technical resources, teaching methodology, and faculty). These components will contribute to successful academic program implementation.

## 107 A Study of Developing Programs in Electronic Commerce



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Undergraduate degrees in Electronic Business or Electronic Commerce are relatively new programs. This paper analyzes six programs (five of which first started offering the program during fall semester 2000) in Electronic Commerce. These programs range from strong technical orientation to more business and marketing orientation

## 108 Incorporating Non-scholarly Literature with Academic Literature: A Starting Point for Teaching Research Methods to Masters Candidates in Information Systems

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Information Technology practitioners and researchers cope constantly with the problems of evaluating new and emerging phenomena. The worldwide web technologies are a prevalent example of these phenomena. These technologies and business trends are discussed, described and advertised in newspapers, web-releases and trade press as well as academic journals and conference publications, consulting reports and government reports. Information from some of these media often falls short of the rigorous screening processes that define academic research. Nevertheless, the information in these sources may be the only information available on emerging technologies to the practitioners. These sources provide the information used by practitioners in the field to make decisions about technology. The people making decisions about these emerging phenomena desperately need valid ways to assess these phenomena. The Research Seminar course we require addresses this need. This brief paper discusses this course, and the methods used to explore emerging phenomena. It is not a research paper. Rather, it describes the course and some of the philosophies used to design the course. A summary of research topics explored during the last few semesters is catalogued.

## 109 Assessment of a Systems Analysis Methods Course in a Small Liberal Arts College

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Marist College is an accredited institution, having been granted accreditation by the Middle States Association of Colleges and Universities. The College is required to assess the overall institutional effectiveness with primary attention given to assessment of student learning outcomes. Each faculty member was expected to choose one of his or her fall courses to prepare for assessment. Two Information Systems faculty members chose to assess the Systems Analysis Methods course. A quasi-experiment using pre- and post-tests was employed to measure increase in knowledge during the semester. The "treatment" consisted of the course lectures, exercises, assignments, and materials. The pre- and post-tests were aimed at the broad categories of systems analysis and attempted to measure each student's ability to synthesize the concepts and ideas of systems analysis and each student's competence in one or more skills related to the objectives for learning. The pre- and post-tests were graded by two faculty members and analyzed. Statistical Package for the Social Sciences Version X (SPSSX) was used to measure the difference in knowledge as reflected by the tests. The post-test scores were significantly higher than the pre-test scores in all categories but one. This paper is a discussion and report of the assessment process and results, as well as of the experience gained.

## 110 How the Object-Oriented Revolution Was Won



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The authors conduct a whimsical interview with an historian of computing at ISECON 2050 and learn why it took Java to vault mainstream systems construction over the barriers to objects. The historian explains that for object-oriented systems analysis and design to feel natural, a good amount of direct experience with objects is requisite. Coding is the only activity that provides actual experience with the nature and properties of objects. Java, much more than C++, expedites this because: (i) Java's libraries supply enforced demonstrations, and (ii) Java, because it disallows free functions, requires verbs to be nouns. The serious intent of this paper is to explain why the switch to Java, even from C++, is worth the effort. Programming is the place for acquainting students with objects. This is one of the chief reasons for including programming in the curriculum for Information Systems.

### 111 Selecting Prerequisite Courses for Student Admission into Undergraduate IS Programs: A New Approach

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The purpose of this study was to compare the effectiveness of the correlation and effect approaches in selecting appropriate IS major prerequisites from a list of nine upper-division business core courses. Since the literature to date has focused solely on correlation, the two approaches had never previously been compared. In forming a methodology to compare the two approaches, the researchers developed two innovations: (1) an Adjusted grade point, which allowed for the control of the professor effect regardless of the statistical approach, and (2) a system of Index values, which aided in the accurate comparison of the results of the two types of statistical tests (stepwise multiple linear regressions versus independent sample means tests) utilized in this study. Conclusions that may be drawn from the study are that: (a) the design and implementation of Adjusted grade points was effective in controlling for the professor effect, (b) the design and implementation of the Index values proved to be a valid means of comparing the results of the two types of statistical tests, (c) the correlation approach is not the ideal method for choosing prerequisites, (d) the use of the effect method, and Adjusted grade points, implicated three upper-division core courses as necessary prerequisite courses for the IS major, (e) when the results of the correlation and effect methods for the IS major are compared, a different set of prerequisite classes are indicated for each approach, and (f) when the results for the IS major are compared to other majors in the college, similar results occur.

### 112 Critical Skills of IS Professionals: Developing a Curriculum for the Future



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A study was conducted to determine the expected skills and knowledge required for Information Systems professionals in three general staffing groups: programmers, analysts, and end-user support. A survey instrument was developed asking respondents to rate the importance of each knowledge/skill area three years from now for each of the staffing groups. The results show that Information Systems knowledge relating to the entire organization and overall business knowledge will be important with less emphasis being placed on specific Information Systems such as Decision Support Systems (DSS) and Executive Support Systems (ESS). More importance will be placed on web-based languages rather than more traditional languages such as COBOL. The so-called 'soft skills' such as teamwork, collaboration, writing and presentation delivery, and interpersonal and management skills will be critical for success in the Information Systems profession.

## 113 The MIS Core Class: Some Possible Solutions

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The MIS core course at our university is currently under a major redesign. Some of the significant problems that we are trying to overcome include student backgrounds, lack of reinforcement of concepts through other courses, faculty's dissatisfaction in teaching the course, and course focus. This paper discusses three different modes of course presentation during Spring 2000.

## 114 Rapid Curriculum Development: A RAD Approach to MIS Curriculum Development



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Curriculum in Management Information Systems (MIS) is subject to constant pressure due to changes in business, the computer industry and technology. Clements (1989) suggests many

curriculum statements are the result of conscious or unconscious copying of 'authoritative' existing statements, while Truran (1997) suggests a model somewhere between 'muddling through' and an ecological model. An examination of a major curriculum rewrite in MIS curriculum in an Australian university has shown that applying an ecological model for the forces shaping curriculum can be effective in rationalizing those forces. The idea of Rapid Application Development (RAD) can be effective and efficient if applied to curriculum development and implemented in consideration of an 'ecological' view of competing forces.

## 115 Personal Software Process Technology: An Experiential Report



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Process improvements within software development occur at three different levels: the organizational level, the project/team level, and at the individual engineer — or personal — level. The Software Engineering Institute (SEI) of Carnegie Mellon University has developed process improvement models tailored to each of these levels. The Capability Maturity Model (CMM) deals with organization issues, the Team Software Process (TSP), currently under validation testing, address improvements in project or team development processes, and the Personal Software Process (PSP). The focus of this paper is on individual software engineer's issues addressed by the PSP. The Personal Software Process (PSP) provides a framework that individual software engineers can use to define, instrument, and continuously improve their individual processes. After five years of experience in teaching PSP in both academic and industry settings, we have gained some insights into the challenges and rewards of transitioning this technology into an organization's software development practices. Our industrial experiences included work with the Motorola Paging Products Group; Boeing Corporation's Space Division and the Naval Oceanographic Office (NAVO). In this paper, we will relate our experiences with the transition of PSP technology into these three organizations. We will describe various approaches taken with industrial PSP training, and report data to validate the benefits of PSP. We will further describe some barriers to PSP training, the challenges of post-training activities, and offer conclusions about the transition process.

## 116 The Perfect Systems Analysis Project



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Systems Analysis and Design, a course traditionally offered in the information systems major, has long been problematic for some students and instructors. For a number of reasons, valid and invalid, students today come to the systems analysis course looking for concrete computer-based skills and find they are asked to learn other things. These topics include for example: questionnaire design, program evaluation research technique (PERT), return on investment, and oral presentation. Given the crisis in software development, that a large percentage of developed projects are never implemented, the author believes it is unwise to eschew software development in a systems analysis class. Having students work on a project with a real user, a project which will only be implemented at the user's discretion, a project which is visible to the entire world, may be the best way of communicating the importance of user satisfaction, even if it is at the expense of learning other material. The author proposes a solution in the form of a model, which guides students in building faculty web pages.

## 117 Introducing Information Technology Students to a New Major: The Role of an Introductory Course Sequence



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Information Technology is defined as a philosophy of applying complex tools to complex information management problems using a tool-oriented, problem-solving methodology. The primary themes of one medium-sized, southern, state university's four-year degree program in information technology include the use of high-level computing tools for solving problems, the importance of technology evaluation skills, the goal of increasing productivity, the need for two voices of communication, and an emphasis on rapid, life-long learning. A two-course introductory sequence in information technology offered at the authors' university's computing school utilizes innovative teaching assignments in a two-course introductory sequence to acquaint its students in the fundamentals of this new major.

## 118 Re-engineering the MIS Capstone Course: Continuously Improving the Learning Process

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Over a three year period, I applied the theories of Total Quality (TQ), specifically, Business Process Re-engineering (BPR) and Continuous Improvement (CI) to improve a course syllabus-based upon my observations of the student learning process (in a MSMIS Capstone project course in which each student re-engineers a process from their workplace). In the first year, I made the observations personally. During the last two years, I have had students look back on their semester-long learning experience and submit a re-engineered syllabus (in the form of a take-home final). Rather than radically re-engineering the syllabus, student submissions exemplify recommendations of improvements. Not only does the magnitude of the input vastly improve the syllabus, but students gain experience with CI. This experience, in addition to their BPR projects, enable them to better understand the differences between BPR and CI. A sample syllabus and reference list are included with a discussion of the process.

## 119 A Hybrid Computer Network Course for IS and CS Majors



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The rapid changes and assimilation of computer networks into the business world have placed new demands on the traditional computer networks course. The volume of material is ever increasing yet the practical, theoretical issues are still very important. This paper discusses a Computer Networks course that attempts to blend the traditional, technical aspects of a CS course with the business and information emphasis of a traditional IS course. The course is supported by a heterogeneous networking laboratory providing the students with hands-on opportunities and activities.

## 120 A Proposed CIS Curriculum to Support Implementation Framework for e-Business Solutions

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Since commerce on the Internet began in 1993, the number of organizations conducting business over the Internet has exceeded most market projections and expectations. However, the track record of implementing successful e-Business solutions has been spotty at best. To achieve successful results on a consistent basis, companies need to rely on a robust framework to guide the design and implementation of their e-Business strategy. Closely tied to these concerns is the issue of staffing and human resources. It is

common knowledge that the Information Technology industry is currently experiencing a severe shortage of IT personnel, especially in the e-Business development area. How do we prepare professionals for this information technology environment? What skills do these professionals must acquire to have a successful career in the new computing paradigm? What role(s) can academic institutions, particularly departments offering information systems and computer science curricula, play in preparing the workforce for the e-Business-based IT world? This paper first discusses issues pertaining to the design and implementation of e-Business solutions with an objective of suggesting a possible framework. Based on this suggested framework, and along with the data gathered from professionals in the IT industry, the paper will next examine and assess technology skills that are essential to support the suggested implementation framework. Finally, the paper will suggest an IT curriculum that in all likelihood will enable students to acquire skills essential for a successful start in the new e-Business and dot-com-based IT computing environment.

## 121 Developing an International Business-to-Business Process Curriculum: Extending the Classroom Walls with ERP-Software



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As businesses progress into the 21<sup>st</sup> century, they have embraced an ERP driven, web-centric, business to business process orientation in an effort to remain competitive. In order to prepare students for this new process oriented e-business world, Universities need to develop curricula that not only expose students to the use of ERP systems but also introduce organizational and technical issues that enterprises face when developing business to business processes. This paper describes the framework and continuing development of a cooperative curriculum between two Universities that address these issues of new e-centric business practices. The developed curriculum utilizes SAP R/3 and the web to link geographically dispersed students to address cross-cultural and inter-organizational issues revolving around ERP, helping students to understand the integration of business processes.

## 122 A Computer Performance Course for an IS Program



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This paper presents ideas and actual experiences accumulated over the past 15 years on conducting a senior level course for Computer Information Systems (CIS) majors on benchmarking the performance of computer systems, applications software, and systems software. This paper also is intended to serve as a guide for those faculty who are interested in conducting such a course.

## 123 A Model for Teaching Global Dimensions of Information Technology in MBA Programs



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This paper outlines the structure of a course for teaching the global dimensions of information technology (IT) to Management Information Systems (MIS) majors in MBA programs. It estab-

lishes the rationale for offering this course, identifies the important topics to be discussed, and provides a tentative syllabus for a fifteen-week semester. A model, to be discussed in the first week of the course, is included to introduce the global context of information technology to business students. The paper concludes with the notion that in the coming decades, the information infrastructures of multinational corporations will be integrated with the Global Information Infrastructure (GII). A broad understanding of the emerging international issues in IT is, therefore, indispensable for students of MIS as the future information technology leaders in transnational corporations.

## 124 IS'97 Model Curriculum: Where Do Enterprise Resource Planning Systems Fit?



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As businesses world-wide begin to adopt Enterprise Resource Planning (ERP) systems in increasing numbers, academics are deciding how to utilise these types of systems in Information Systems (IS) curricula. Alliances with some of the ERP vendors have enabled some universities to develop innovative courses and subjects. Nevertheless, the limited research in this area has only outlined case studies or examples of ERP use in IS. In this paper we outline how ERP systems can be incorporated into a broad IS curriculum model such as IS'97 thus providing a guide to institutions that may be contemplating the use of ERP in their curriculum

## 125 On Teaching a Data Structures and Algorithms Course through a Rigorous Approach



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In this paper we describe a methodology for constructing efficient algorithms applied in an elementary course on Data Structures and Algorithms. This methodology attempts to show the essential steps in a sequential process in software development from an informally stated problem, via a formal problem specification, to a final efficient program. Students of the course are expected to have at least a year's experience in programming high level languages and elementary logic and calculus. We describe a prototype, AyDA, which assists in the construction of algorithms starting from the proposed methodology.

## 126 Does COBOL Have a Future?

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This paper will describe the results from a survey taken of professional business and industry employers who are using COBOL in their information systems. A discussion of the IS Manager's view of the future of COBOL is presented. Almost 90 percent of IS Managers surveyed indicated that COBOL should continue to be offered in college curriculums, and also nearly 90 percent indicate that both object-oriented and web-based features of the COBOL language should be integrated into COBOL instruction in college curriculums. It is hoped that these results will help academia to design their curriculums to meet the expanding need for IS people over the next five years.

## 127 A Design Tool for Novice Programmers

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Most program design methods are intended for experienced programmers. Beginner friendly program design methods date back to procedural languages, such as Pascal and Basic. These methods lack connections to objects and events since the lan-



guages contained neither objects nor events. This paper presents a summary table and a sketch to get novice programmers started in the process of designing a program. The table organizes information about the program requirements and aides in creating a design for a program that may contain events and objects. The sketch represents the calling relationships among the modules in the program. The table and the sketch can be use with an existing method, such as pseudocode. The tools enhance existing methods of design. A new method is not proposed. The most important philosophies in developing the tools were simplicity and guidance. The table guides the student's design efforts and is simple. The columns collect data about what the program does, when it does its tasks, and what data it uses. The rows relate tasks, events, and objects. The table prompts identification of objects and evnts and makes high-level functionality stand out. The high-level functional design captured by the table is made explicit in the relations sketch.

## 128 Process Evaluation of the Computer Fraud and Abuse Act of 1986

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This study is an evaluation of the Computer Fraud and Abuse Act of 1986. The study reviews existing computer crime policy implementation, found the implementation slightly inappropriate, and recommends new process and a model that can be used to enhance implementation of the act and punish perpetrators. The study represents the result of a scholarly endeavor to link information systems and government policy. The report is organized into six primary divisions: problem identification, review of related literature, methodology, findings, conclusion and recommendation, and summary.

## 129 Surveying Students about Computing: Results of a Two-Year Study



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As part of a continuing effort to understand our students in order to inform our teaching, we have surveyed the students in our core computing class at the start and the conclusion of the fall term. The surveys solicit information on prior experience with computing, attitudes towards computers and technology and other academic matters, hopes for the course, knowledge of current events and general demographic information. We present here our analysis of two sets of surveys given in fall 1997 and fall 1998. The findings confirm some subjective impressions on the part of the faculty, indicate opportunities and also reveal challenges. This is a follow-up study of a previous published study.

## 140 The Teaching of Net-Centric Computing

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This paper presents the subject of net-centric computing as one that spans a spectrum from static html web pages to the development and control of distributed, multi-tier components. It poses the dilemma of attempting to teach this important body of knowledge that requires multiple languages and tools in an already tightly packed Computer Science program, and presents a solution that utilizes three pedagogic devices: (1) A series of lab exercises that incrementally spans the defined spectrum and that presents Starters that act as models for the languages being learned, (2) Web-based notes and classroom demonstrations, and (3) Online tutorials, reference manuals and white papers. The paper also discusses the problems inherent in the teaching of methodology vs. specific languages, software systems and tools and how it is being approached by expansion of Device 2 into Course Technology Modules.

## 141 Creating An Undergraduate E-Commerce Concentration: A Case Study



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Due to falling enrollment at a school of management, many options were considered to rectify the problem. One of the

solutions proposed was to create a concentration in e-commerce (which was subsequently changed to e-business). This paper details the steps taken by the task force to realize that objective. The process of creating the e-business concentration is not yet complete, as the proposal is yet to be evaluated by curriculum committees.

### 142 Using Electronic Commerce as an Integrating Tool for Teaching Major MIS Concepts



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The inherently interdisciplinary nature of electronic commerce makes it an ideal basis for an integrative course in information systems. This paper describes the initial design and on-going implementation of a 'pre-capstone' course for undergraduate MIS majors. The course presents the major technologies and operational issues underlying e-commerce to a class of students of various skills and classroom experiences — with the intention of providing students a more meaningful experience earlier in the MIS program. The effectiveness of this approach will be evaluated upon completion of the course and analysis of the results.

### 143 A New Undergraduate Program in Information Science



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A new undergraduate program in Information Science is described. The program addresses the need for graduates prepared to specialize in the use of computerized information. This is a unique program. It is a technically challenging program that builds on a strong foundation in computing and looks at information as a serious topic of study in its own right. The program shares its first three semesters with a Computer Science (CS) degree program; however it includes five required courses that are not required of the CS majors and boasts a different, albeit overlapping, set of elective courses. The program promises to be exceptionally strong in its coverage of Web related topics and information theory.

### 144 Integrating Information Technology in a School of Business Core Curriculum: A Collaborative Strategy



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There is little consensus among business schools about the appropriate role of information technology (IT) in the business core curriculum. New IT tools continue to evolve at a rapid pace imposing a need for the continuous review of which tools to include and where in the curriculum they should be offered. This paper presents a dynamic strategy using web-based survey forms for collaborative curriculum design, evaluation, feedback, and redesign.

## 145 FAQ's for ISE



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Lists of frequently asked questions (FAQ's) are common in our culture. The way we use them provides a flexible model for documenting and addressing concerns of information science educators. A "strawman" list of 24 items is included as a starting point for designing an online forum and repository for concerns related to ISE curriculum.

## 146 Utilizing the Rational Rose OOAD CASE tool for Visual Modeling using the UML in the Systems Analysis and Design Sequence



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The use of visual modeling in object-oriented analysis and design (OOAD) has many advantages in the current software development environment. A software CASE tool that can automate the development of these visual models utilizing the very popular Unified Modeling Language (UML) is Rational Rose 2000 from Rational Software Corporation. This software is available from the Rational Software Corporation to qualifying educational institutions as part of its SEED program. After obtaining Rational Rose 2000 under the SEED program, this software was successfully used in a two course Systems Analysis and Design sequence.

## 147 Rightsizing the CIS Department: Victim of Fate or Master of Destiny

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Increasing demand for information systems professionals frequently translates into increased enrollment of CIS majors. This groundswell in demand poses both a challenge and an opportunity for CIS programs. Rightsizing the CIS Department, through active management of the admissions process not only works to improve the quality of graduates, but provides a much fairer mechanism for allocating scarce faculty and classroom resources than does a more open admission policy. This paper explores the formulation of one such admission policy in a successful CIS program and presents the initial results of its application.

## 148 A Java Programming Two-Course Sequence



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Java is very hot right now in the development world. With this, we need to be considering to offer at least one course in our IS or IT course sequences. In this paper, I am going to discuss the transition in our school from a single Java course to a two course Java sequence. I will then discuss the each of the two courses and their contents. After that, I will discuss the reason for the two-course sequence. I will discuss the key topics to be covered in each of these two courses. Finally, I will mention the possibility of even a third course.

**161 Chinese and American Students: Analyzing a Case Study in a Virtual Environment**

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**170 Panel: Computing Across the Curriculum**

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**171 Panel: IT Programs and CS Departments**

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## 172 Panel: Forming and Managing Project Teams in IS Classes

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## 173 Panel: Accreditation Criteria for IS/IT Programs



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## 174 Panel: IS'2000 Progress Report on Undergraduate IS Curriculum Development

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**180 Seminar: Component-based Software Development in the Undergraduate Information Systems Curriculum**



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**181 Seminar: Using the ICCP Associate Computing Professional (ACP) Certification Test as an Exit Exam for a Bachelor of Science in Management Information Systems**



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**182 Seminar: Extending Theory to Practice in Information Systems Education**

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**183 Seminar: Building an MIS Curriculum for the 21<sup>st</sup> Century: Some Thoughts**

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## Track: Internet Course and Curriculum Development

### 200 Delivering Internet and Programming Courses Online



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A new thirty-credit certificate program in Internet and Multimedia Technology (I/MMT) has been designed at the Essex Campus of the Community College of Baltimore County (CCBC-Essex). This paper provides descriptions of three required courses in the program for which online versions have been created: Internet Literacy, Visual Basic I and Internet Programming.

### 201 Virtual Lab Experiments in Telecommunications for Distance Learning

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Telecommunications courses in signal transmission, data communication, networking, and other areas all require comprehensive hands-on experiments or communication simulation labs. The labs and the ability to perform telecommunications experiments are not readily available to the student in distance learning. This paper introduces industry-available software that can be used to create virtual lab experiments for distance learning. Software simulation methods can be adapted to create virtual lab experiments, and practical experiments in telecommunications-based on the simulation software are introduced. This paper also identifies the need for further research and development of software tools suitable for telecommunications experiments for distance learning.

### 202 Developing an Internet and Multimedia Technology Certificate Program



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This paper describes the process of developing a new thirty-credit Internet and Multimedia Technology certificate program, and highlights activities from the first year of the program at the Essex Campus of the Community College of Baltimore County (CCBC-Essex). First year growth, student progress, and difficulties encountered are described.

## 204 Facilitating an Online CIS Course: A Case Study



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Many institutions are beginning to offer courses and, in some cases, entire degree programs using electronic learning technologies. Instructors, accustomed to the traditional classroom, struggle to understand the new technology and the new pedagogy required in the “virtual classroom.” To be successful in this new environment, it is not sufficient to put lecture notes and some assignments on the Web for students to access. The instructor must convert each unit of material into a variety of activities that help the student achieve the learning objectives. Assessment of student learning must also be adjusted to reflect the online environment. This paper describes the various learning activities and assessments that comprise an online Computer Information Systems (CIS) course currently offered at our institution. The course, Introduction to Information Technology, provides a broad coverage of topics such as hardware, software, applications, networking, etc. We present the components of the online course, along with observations based on experience that we have had during the planning, development, and facilitation phases of the course.

## 205 Information Assimilation over the Internet: An Initial Study

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Although the Internet holds the promise of long-distance education, multimedia entertainment etc., the quality of multimedia documents delivered by the Internet can vary enormously. In this paper we examine how varying quality of service affects a users’ perception and understanding (and thereby learning) of multimedia presentations. Our results show that the quality of multimedia documents can be severely degraded without the user having to perceive any significant loss of informational content.

## 206 CourseWeb: A Report On Using WebCT for Course Notes



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The author has been supplying course notes to students on the computer network for many years. These were usually developed using a word processor, but in 1999 the course notes were converted to web pages so they could be viewed by a web browser. This system, referred to as CourseWeb, allowed the use of hyperlinks to definitions and other resources available on the World Wide Web, which (hopefully) provided a richer source of course material as well as making the notes more enjoyable for the students to use. One disadvantage of the 1999 version of the author’s notes was that they were stored as files on the local network, which means they were inaccessible from outside TWP. This year, the notes have been incorporated into TWP’s WebCT server, which in addition to making them available outside the Polytechnic also provides a bulletin board where students can post queries to the tutor and share ideas. This paper provides the results of a survey which was given to the students in 1999 on the general effectiveness of CourseWeb. In addition, the paper reports the results of a survey given to the students in 2000 that assesses the effectiveness of the notes using WebCT with its extra features as well as the author’s experience using WebCT.



## 207 A Paradigm for Selecting an Institutional Software



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This paper proposes a paradigm for selecting an institutional software. The proposed paradigm includes finding an applicable theoretical framework for guiding the integration of the software into the institution, customizing this framework to suit the institution, considering institutional guidelines and policies relevant to selecting proper software, selecting the appropriate software product according to specific evaluation criteria, and evaluating the entire selection process for future reference. This paper documents the use of the proposed paradigm using a Canadian university's selection of an on-line courseware as a case study.

## 208 E-enabling Systems Analysis and Design: A Case for Extending the IS Curriculum



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This paper argues that as information technology and organizational forms rapidly evolve, so must the domain of competencies of systems analysts and designers also evolve. The new economy, e-commerce and the concurrent rise of disruptive technologies are characterized and then a specific example is then provided using business webs as a new context in which systems analysts must effectively operate. To e-enable systems analysis and design, it is argued that the IS curriculum (both IS'97 and ISCC'99) be extended to include two additional competencies analysts and designers must possess to be able to innovatively and strategically contribute in this new Internet-based context: value proposition analysis and design and web-based business modeling.

## 240 e-Education: A Case Study

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The Internet is breaking all barriers of time, distance, language and boundaries. Its popularity can be attributed to its simplicity and accessibility. A user needs only a personal computer and access to an Internet service provider (ISP). Traditional organizations are joining "netpreneurs" in creating a virtual business environment. E-retailing, e-b2b, e-advice, e-management and e-banking and many other Internet-based activities are becoming norm for many people. E-Education is not far behind. Many for-profit virtual universities are already offering on-line courses and digital diplomas. E-education, however, is not without its critics who question the quality, control, delivery, and integrity of education over the Web and, in many cases, the worth of the "digital diploma" itself. E-education is here to stay, however, there are many conceptual issues that still do not have any answers. Can everyone benefit from Web-based education? or is it only suited to people with certain kinds of learning styles and personalities? This paper describes how one university is "Internetizing" its curriculum and discusses authors' experiences in developing a web-based course.

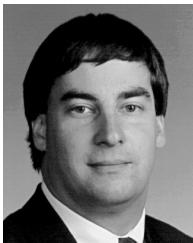
## 241 Student Portfolios: Bring the Kids When You Move to the Web

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There is a better approach to exploiting the Internet than piecemeal electrification of instructors' materials. This paper offers a system that balances instructor content with student content using a database approach that not only delivers course materials, but also delivers student portfolios created in response to the course materials. The Internet-based student/teaching portfolio system facilitates implementation and assessment of competency-based curricula. The heart of the system is a database containing instructor provided course competencies and activities/assignments that students complete to demonstrate mastery of the competencies. For each activity/assignment, the database contains instructor provided detail and help; Web resource pointers; and assessment description. Although the delivery of course materials is an important component of the system, the system is believed to be unique in its focus on showcasing and delivering multimedia portfolios the students create in response to the various competency activities. That is, it is unique in its focus on multimedia portfolios that students create to demonstrate their mastery of competencies developed in student life activities, career planning efforts; and in formal course work. During the system's five year development, implementation, and revision period, more than four thousand students from multiple institutions have been involved in building Web-based multimedia portfolios using the system.

## 242 Distributed Learning: What Makes for a Successful Course?

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Distributed learning presents universities and colleges with the ability to expand their reach into new markets and stay competitive and relevant in this dynamic information-based global economy. Through the effective use of distributed learning tools, location and cost are no longer barriers to earning a degree and

will enable universities and colleges to reach working adults, international students, as well as the traditional undergraduate student market. This paper focuses on the evolving transformation of distance learning models to technology-based distributed learning modes. While each institution has its own mission and goal for distance learning and distributed learning, there are certain things that need to be considered while developing or implementing a curriculum that involves education at a distance. This paper explores distance learning from a macro perspective and suggests some critical success factors that will aid faculty and institutions in distance/distributed learning development. The authors will also share some of their experiences.

## 243 Teaching an Internet-Delivered General Education Programming Course



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This paper details the past, present and future of a required general education programming course that is distance delivered exclusively via the Internet. The paper presents information on how the course materials are presented, graded and returned to students. It details a method of delivering Internet-based content using a website and supplementing instruction with Real Video. Future considerations and tools are also presented.

## 244 Incorporating Distributed Learning Technology in EMBA Education

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This study (research in progress) investigates the students' perceptions on distributed learning using information technology. The specific distributed learning technology under study is Lotus LearningSpace™. The technology has been implemented for an executive program in a Midwest University. The research question to be answered is that whether using technology in management education is as effective – and often more effective - as traditional instructor led learning.

**260 The Critical Problems of Internet Systems Development: Implications for Teaching of Internet Technologies**

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**261 An E-Commerce Course in the Undergraduate Curriculum**



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**Track: Industry/College Partnerships**

**300 Industry/College Partnerships: Using Industry Partnerships, Corporate Donations, and Grants to Create an ERP Program**

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The demand for graduates trained in enterprise resource planning (ERP) software and methodology has been steadily growing in the corporate community and there have not been enough employees available to fill industry demands for people able to use ERP software and to do ERP work. The College of Business Administration (CoBA) at the University of Texas at Arlington (UTA) sought to fill this gap by joining an alliance with a major ERP vendor, SAP America. This paper describes the planning, preparation, implementation, and post implementation scenarios of the SAP R/3 software system deployment at UTA. It also discusses the college's efforts to integrate the R/3 software into the curricula as well as efforts to staff and fund the project.

**301 Integration of Enterprise System Software in the Undergraduate Curriculum**

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While recognized as an important element of Information Systems (IS) curriculum, Enterprise Resources Planning (ERP) remains absent from many universities and at most schools, or is only discussed at a theoretical level. However, the benefit of exposing students to a hands-on, enterprise wide system that integrates business and technology course content makes it attractive for adoption in undergraduate IS curriculum. Several obstacles make ERP difficult to implement in undergraduate curriculum. Among these are cost, hardware restrictions, lack of data, re-education of faculty and the tremendous task of integrating ERP into existing course content. This paper explores three of the leading Enterprise Systems (ES) programs within Universities, and provides examples of how they are being implemented. Data was collected from vendor representatives, publicly available corporate information and from faculty experienced in ERP implementations. This paper suggests five levels of immersiveness that can be used as a guide to match resource availability and academic program for the adopting institution. We conclude by suggesting an investigation and adoption model that can be used to guide product selection and course adaptation.

### 303 Do Industry-University Alliance Programs Corrupt the Mission of the University: A Theoretical Perspective

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Industry-University alliance programs allow educational institutions to train students on current products at reduced prices. One consequence is that students are exposed to one product over another. This paper theorizes an educational program tilted toward one vendor's products result in unintended, long-term consequences for the student. Is the student harmed by learning Oracle versus Informix (for example)? Do such programs reduce the university to a technical training institute? The problem is described in this paper from the perspective of the student, the vendor, and the professor. The analysis of this phenomenon builds on Lederer and Mendelow's (Lederer and Mendelow 1990) model of the impact of the environment on I.T. evolution. A model is developed which suggests mitigating strategies and possible outcomes.

### 370 Panel: Academic and Industry Alliances: Experiences with SAP, Oracle, Sterling, and PeopleSoft

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**371 Panel: The SIU Carbondale Information Management Systems/TruServ/Just Ask Rental Website Development Project**

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**380 Seminar: Teaching Workshops on the Management of Telecommuting Programs**



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**381 Seminar: Establishing Linkages between Higher Education Institutions and Industry**



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## Track: Best Practices

### 400 Objects as Hypertexts: How to Render Objects with HTML for Teaching Purposes



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This is a description of a technique (and a tool, called `HtmlStream`) to visualize Java instances in HTML, Hypertext Markup Language (W3C 2000), format. It can be used to teach Java by clearly (and automatically) showing the relationships between class and instance and between classes and subclasses. Some basic knowledge of Java is required. This article is structured as following: 1) why we did it; 2) the output produced; 3) how to use it; 4) a consideration about UML, Unified Modeling Language (OMG 2000); 5) usage in actual courses; 6) final comments.

### 401 An Empirically-based Technique for Improving Communication Skills of Systems Analysts

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Few would argue with the premise that communication is critical to an Information Systems professional's success. While researchers recognize the importance of communication, organizations and individuals continue to have communications problems because remedial action is rarely suggested. The purpose of this paper is to recommend an interpersonal communications technique that helps a systems analyst develop much more convincing arguments and presentations to users. The technique has been used and documented in the classroom, where it provides an interesting, fun, convincing, and memorable experience for the students. Class-

room experiments that demonstrate the effectiveness of the technique have been extremely favorable. The technique is regularly used by the professor in teaching Systems Analysis and Systems Design. The focus of the paper is on the classroom experiment, and the conclusions that can be applied to the profession as a whole based on those experiments.

### 402 Educational Computer Software, Technical, Criteria, and Quality



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There are many computer programs available for use at home or in school, for educational or entertainment purposes. The main factor to providing a better learning experience lies in choosing software that successfully combines education and entertainment. The only way to know how learners will use a particular course of a piece of software and what problems they experience, is to study them using it. To obtain empirical evidence of pupils' performance in order to judge the instructional effectiveness of software, therefore choosing software can be productive, if using a select list of criteria. It is important that each instructor compile his or her own list of criteria, ranked according to their own needs. So the out line of this paper is to provide a variety of data and methods to be considered when trying the software packages, the overall emphasis is on educational issues.

### 403 Integrating Information Systems Education into Competitive Intelligence Education at Four Levels: K-12 to Post-Graduate

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Today's Information Systems (IS) curriculum is evolving to respond to the globalization and diversification of information space. IS educators continue to expand traditional definitions of information work, and to offer courses that extend beyond the boundaries of contemporary uses of IS. This is a key to the continued long-term relevance of IS programs in traditional academic institutions. Information systems provide critical support for the functions of knowledge management (KM) and competitive intelligence (CI). Beginning with a brief overview of the current state of CI education, this paper discusses one university's ongoing efforts to embed more effective instruction in CI systems as a core component of IS education. The goals for content redesign are to include greater exposure to creative applications of IS, focus on the need to recruit and retain IS students, provide experiential learning to familiarizes students with emerging technologies, encourage innovation and creative use of emerging IS technologies, support career objectives of graduate students and IS practitioners and meet the business objectives of employers. The results, in the form of student projects and presentations, have validated this approach.

### 404 Introduction to Business Systems Development Students Perspective of a Problem-based Learning Approach



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This paper presents the results of a qualitative research study aimed at understanding students' perspectives of a trial of Problem-based Learning (PBL) in a traditional information systems course structure. Issues that arose and difficulties that were encountered by students are discussed. The major themes identified from the students' perspective of the Problem-based Learning approach were: improved problem solving, improved time management, self learning, improved research skills, improved group work skills, and the use of realistic problems. Issues included a focus on factual knowledge, problems encountered with group work participation, weaker students requiring more direction, and preparation and motivation for PBL.

### 405 A Case Study in Teaching Programming using a Hybrid Instructional Model



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The debate surrounding distance learning versus the traditional classroom has often been presented as an either/or situation. Actual practice finds that many teachers use asynchronous tools to support a traditional course structure. The authors have tested an instructional model that does the reverse: a 'mostly' distance-learning course that uses required and optional face-to-face sessions to support learning. An additional challenge for this course was to teach modern programming concepts in a compressed time period. This paper describes the history of the course, starting from a decision to focus on programming games. It continues with a discussion of what factors influenced the design and results of the course, and concludes with reflections on the course's success.

## 406 Incorporating Problem Solving into Programming Classes



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Problem solving involves far more than the ability to plug numbers into a formula and looking to a calculator to resolve an answer. The real world presents problems, described in words, that require creative applications of the more fundamental principles taught in physics, mathematics, and business classes. The unpopularity of “word problems” and the difficulty in teaching creative thinking have generally led educators to avoid problem solving in favor of equation solving. This paper demonstrates that methods for finding creative solutions to novel problems can be codified and taught within the structure of a programming class.

## 407 Implementing Peer Technical Reviews in a Large-sized Database Course



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The peer technical review is a quality assurance activity that has been proven to be valuable in producing better quality software. With careful planning and instruction, a student peer review process can be designed and implemented so that students can learn about, and practice, this process within the classroom. This paper discusses the value of peer reviews in a classroom setting, the challenges to implementation, and how they can be integrated into a large-sized database design course.

## 408 Constructivist Implications of Preconceptions in Computing

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The theory of constructivism has several important implications for methods of teaching. One of these is the need to explicitly confront student preconceptions. In this paper we explain how preconceptions effect student learning, according to the constructivist view, present an initial collection of preconceptions which computer science educators must address, and discuss how identifying these preconceptions can help improve student learning in CSIS.

## 409 Project Vision: An Integrated Approach to Information Technology Education



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This paper describes a computer science/information sciences and technology curriculum. Specifically, Project Vision focuses on active, cooperative, student-centered learning that is supported by technology. The Project Vision curriculum has included: an opportunity for students to lease a notebook computer that is pre-loaded with a “standard image”, i.e., software that is needed for most course work in the curriculum; supplemental instruction, i.e., seeking to increase retention by pro-actively creating a learning community atmosphere; instruction and practice in team-based learning and problem solving; and integration with selected general education/liberal arts courses.

## 410 Introducing First-Year Students to Theoretical Computer Science



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There is a need to educate students about advances in Computing Theory that are effective for new technologies. This work describes an introductory course implemented in the Undergraduate Degree Program in Systems Engineering at U.N.C.P.B.A. (“Universidad Nacional del Centro de la Provincia de Buenos Aires”) in Argentina. This course provides an introduction to the theory of computing, starting from the study of a hierarchy of formal languages and automata, and basic concepts of computability and complexity by Turing machines. It has been organized in a way that is accessible to first-year students.

#### 411 Threaded Live Case Study Lessons Learned



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The case study (a.k.a. “Harvard Case”) is a widely respected and utilized pedagogical instrument in management education. Although commonly used in upper level IS courses relating to strategic planning and policy, it is not so commonly used in IS courses relating to technology capability and application. This paper presents a discussion of the case study concept as it has been used for the past four years across segments of an IS curriculum. It differs from the Harvard case in two ways: first it is live, engaging students in IS practice and second it is threaded, intertwining a series of IS courses covering various curriculum aspects. This paper presents results of this approach and survey results from four years of students participating in the pedagogy. The concept is interpreted in the BSCIS program at Bentley College.

#### 412 Information Science: Forty Years of Teaching

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Forty years of teaching Information Science at both the undergraduate and graduate levels has revealed that there is in fact a fundamental definition that can be used to describe the field and guide its development in the years to come. In short, that definition states “Information Science is the scholarly occupation that attempts to establish the principles and laws that govern the augmentation of human capacities through technology. This concept can be conveyed in teaching through the use of the EATPUTr system model. My long experience in the field has also revealed several basic requirements in the education of Information Science. These requirements are discussed within the paper.

#### 440 Teaching Problem Solving Techniques and Software Engineering Concepts Before Programming

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This paper outlines research currently underway that seeks to determine the impact of teaching various concepts before a programming language. Many educators have espoused the concept of preparing learners for success in Computer and Information Science by teaching problem solving techniques, approaches to design and software engineering concepts prior to actual coding. While various efforts to implement this approach exist, very little empirical data has been accumulated. Course content effectiveness research in this area is relatively sparse.. This research measures the learning of two groups in a first programming course after participants complete pre-programming courses with varying content.

#### **441 Using Websitegarage.com as Site Analysis and Design Tool**

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Websites from eight western colleges of business were analyzed using Netscape's websitegarage.com tool. This site automatically analyzes and generates reports of a website's design and performance. Factors rated include browser compatibility, search engine index measures, load time, dead link, popularity, spelling, and HTML syntax correctness. Most of the selected sites rated "Fair" overall, with only two sites rating "Good". Factors with the most negative impact on ratings were found to be (1) search engine indexability, and (2) load time as measured by the number of bytes of graphics.

#### **442 Alternatives of Teaching Web Database Programming: JDBC, SQLJ or CGI**



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Web database programming was added to the author's undergraduate database course several years ago. Among many approaches of accessing data to the database, JDBC, SQLJ and CGI were chosen to teach in different semesters. The comparison and contrast of the three approaches were provided. Oracle programming examples of each of the three approaches were given. The paper also described the template methodology that the author has been using in her teaching for years. A template is a sample database application program written with a host language and embedded SQL statements. By modifying the templates provided in class, students were able to do their homework and complete their database programming projects.

#### **443 Finding the Critical Success Factors in Distance Learning**

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The Internet is providing the opportunity to deliver accessible, up-to-the minute material to anyone in anywhere. By using this tool, the industry can improve productivity in a collaborative environment. The initial investment in collaborated information sharing is paid off in a rather short time, leading to tremendous cost cutting and reduction in overhead. If the infrastructure is already setup, the conversion of a traditional delivery system into an online system is not very expensive. However, the issue of student performance in an on line system is important and complex. There are many factors that can contribute to the performance of the students. What are these factors? It is the thrust of this paper to identify the important ones.

#### **444 On a New Teaching Paradigm for Information Systems**

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The Input -> Process -> Output concept has been a basic teaching paradigm of the computer field since its inception. This notion is imbedded in the "Systems Concept," in programming and in the teaching process. Since those days many things have changed, including improved speed and access to data, faster and larger processors and memories and vastly improved communications and networking capabilities. Because of these changes, it is time for a new paradigm, one that includes current technologic, theoretical, and conceptual approaches. We call this the "Communication Driven Paradigm." This paper presents starts by describing the evolution of data processing from its beginning to present times, the changes and realities of each stage, and the relevant descriptive system diagrams. It then presents the new "Communication Driven Paradigm" and its diagramming. This paradigm can be used to describe system development using either object oriented or structured systems analysis and design.

**460 Teaching Data Management / Data Administration in Management Information Systems**



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**Track: Leading Edge and Emerging Technologies**

**500 Evaluation of Post-test Scores for a Web-based Tutorial Authoring Tool that Encompasses Pedagogy in the Development Process**

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Educational content on the Internet is rapidly increasing. Academicians and businesses are placing more course material on-line to supplement classroom and business training situations. In addition significant increases in undergraduate enrollments in Information System courses and the rapid pace of new knowledge in the field leads researchers to call for new innovative approaches to learning. Prior researchers have reported that this new web-based training technology (which has its foundation in computer-based training) has not integrated sound pedagogical practices into the authoring process when developing new tutorials. This paper summarizes an experiment to evaluate the effect on posttest scores of a web-based authoring tool that includes learning theory in the development process for the author. Early results indicate that the tool is more effective than traditional HTML authoring tools and that the number of exercises affects posttest scores in a positive manner.

**501 A Comparative Study of Traditional Electronic Data Interchange versus Internet Electronic Data Interchange**

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Electronic data interchange has resulted in the boosting of profit and productivity for business. Companies are able to be competi-

tive by migrating from a paper-pencil driven society into an electronic media civilization. However, the electronic media world is looking to make another change. In this ever growing and maturing age of information, more and more people are implementing computers to communicate with one another. Now, people all over the world, have the capability of connecting to other computers anywhere on the globe. The purpose of this paper is to compare the advantages and disadvantages of the traditional electronic data interchange system versus the Internet electronic data interchange system.

## 502 Do Patents Translate to an E-Business Environment?

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The Internet presents a unique challenge for intellectual property management. The state of patents in the current e-business environment was investigated through a survey of the literature and an interview. Copyrights are discussed briefly in the introduction. Current e-business patent trends and issues are discussed. The findings indicate that patents do translate in an e-business environment.

## 503 A Course in E-Commerce Architecture

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This paper describes a course that provides Computer Information Systems students with a basic foundation in the business, technical and risk aspects of e-commerce architecture. The reasons for offering such a course are presented. The goals of the course and its basic structure are discussed. Instructional methods such as case studies, class debates and papers are used to expand the student's understanding of issues and methods used in e-commerce. Students who successfully complete the course are prepared to develop, support and provide advice on e-commerce applications.

## 504 Inventing the "Treebook:" A Workbook with Pages Linked in a Tree



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A spreadsheet program is an ideal tool for recording scores and calculating grades—tasks every instructor needs to do. But anyone who has built a multipage workbook soon learns how difficult it can be to maintain formulas and entries among all pages. To help instructors sidestep these difficulties, we invented a "Treebook"; that is, an intelligent workbook whose pages are linked in a hierarchical tree. This article describes how we used Visual Basic to create two generations of Excel-based gradebooks that culminated in inventing the Treebook. We expect Treebooks will eventually be used in many application areas because they make building large spreadsheet models easier and more reliable.

## 505 Software Agents: A Contribution to Agents Specification



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This article presents informal and formal specifications of some basic concepts (terms) and properties of agent theory, the design and imperative and recursive implementations of intelligent agents and supports agent approach in computer science.

## 506 Developing Algorithmic Thinking with Alice

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Rapid change in information technology motivates a corresponding evolution in our definition of computer literacy. One recent movement is toward Fluency with Information Technology, a key-concepts approach to computer literacy that includes algorithmic thinking. Algorithmic thinking is used to describe one methodology for solving problems. We introduce Alice, a 3-dimensional animation tool. Alice is an emerging technology that provides a learning environment that may be helpful in developing algorithmic thinking. We present our instructional experience with Alice and demonstrate a possible use of Alice to support the development of algorithmic thinking.

## 540 Toward an Automated Patient Care System (APCS)



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Improvements in technology call for the development of patient care systems that can alleviate problems encountered due to decrease in the workforce of hospitals. The systems developed for patient care and clinical care should be real-time systems that can perform required functions. Criticality of patients' health should be taken into consideration while developing these systems. Simulation modeling helps solve the problem in the design of patient care systems. Automated Patient Care System (APCS) encompasses the requirements in hospitals that specifically address the needs of in-patients. APCS aims at the design and implementation of a highly reliable real-time model that provides the means to investigate the feasibility of an automated patient care system. Systems that perform critical missions in unpredictable environments require a significant consideration in efficient use of the available resources. Further, the underlying system requirements should be taken into consideration. The APCS model will address all the criticalities involved and will result in effective implementation of real-time system. The model should be of interest to medical professionals, hospitals and clinics, and the officials of the Health Department as it focuses on the system design and lays out the groundwork for a complete automated system supported by real-time task scheduling and incremental learning techniques for effective performance in unpredictable environments.

## 570 Panel: Issues Involved in Starting and Conducting Electronic Commerce Programs on the Bachelor Level

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**580 Seminar: JavaScripts and Dynamic HTML Workshop**

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**590 Birds of a Feather: Classroom 2K and Beyond: Leveraging New Technologies for Distance Learning**

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**581 Seminar: Computer Security Fundamentals and Applications**



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**582 Seminar: Personal Software Process**



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## Track: Current Issues and Trends

### 600 Software Support in the Classroom: Help or HINDRANCE

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Few researchers have addressed the question of how information system requirements should be derived. The rapidly changing needs of increasingly complex organizations are pressuring the analyst to rapidly produce information requirements. This means the analyst needs the capability to rapidly acquire, organize and analyze organizational facts from which information requirements are derived. This research concerns the testing of an adaptive analyst support system to assist the novice analyst (student) with the gathering and managing of organizational facts. The experiment investigates the use of a graphical user interface (GUI) tool to help the student analyst perform organizational fact gathering tasks preliminary to information system requirements determination and specification. The experiment results are discussed and conclusions are drawn from the results of the dual tasks facing a novice analyst when a software tool is provided.

### 601 The Role of Operating Systems and Network Administration in the IS Curriculum

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The reliance by companies of all sizes on information technology creates strong demand for system and network administration jobs. Information System majors will increasingly find themselves with

opportunities and responsibilities in these areas. However, teaching operating systems and networking to information systems major presents many challenges. We have developed a model for teaching these topics to information systems majors in the context of operating system and network administration. This paper describes our model, the lecture materials used, and a novel lab configuration.

### 602 An Applied DSS Course Using Excel and VBA: IS and/or MS?

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Instruction in Decision Support Systems within Information Systems curricula heretofore has not had a significant applied or hands-on emphasis. In particular, Information Systems faculty have not taken advantage of the availability of modern, Windows-based software tools, such as spreadsheets, that can serve as a Decision Support Systems generator. As opposed to this, Management Science faculty have embraced Microsoft Excel as an instructional tool for quantitative modeling. Recently, this trend in Management Science teaching is being extended to include instruction in Visual Basic for Applications in a Decision Support Systems context. Over several years the author has been working to develop an applied Decision Support Systems class that employed Windows-based software tools. Based on the rationale guiding efforts to incorporate Visual Basic for Applications on the Management Science side, the author developed and offered an applied Decision Support Systems class that included instruction and use of Excel Visual Basic for Applications. The structure of this class is discussed and compared with the Management Science approach in terms of the traditional components of a Decision Support System; models, data, and user interface. With respect to the issue of which discipline area, Information Systems or Management Science, should offer instruction in Decision Support Systems, the author suggests a joint effort in which the respective strengths of the students (and faculty) would complement one another.

### 603 Overlaying Critical Thinking to Information Systems and System Engineering Courses



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This paper reports on the efforts to overlay critical thinking to the courses in computer science and computer information systems in

college courses taught by the author during Summer Session II 1999, Fall Semester 1999, January Interim 2000, and into the Spring Semester 2000, Summer Session II 2000. Activities for doing this are discussed. These include integrating critical thinking with product-based learning (PBL), team-based learning (TBL), and student management teams (SMT). These ideas of teaching and learning are discussed with the objective of communicating with others, enabling debate, encouraging alternative ways, motivating others to do more.

#### **604 From Information Systems to Informing Science: How the Transdiscipline will Transform IS Education**

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Information technology (IT) now permeates most every discipline; no longer is it the sole possession of business and science. On today's campuses its topics are incorporated into most, if not every, field of study. For example, the field of Education advances how to use information technology to teach students and to administer educational institutions. Journalism promotes the use of information technology to research material and create publications. Law faculties use information technology to seek legal rulings and present material in a courtroom. Much of what is taught in each of the fields in the use of information technology to inform their clientele is the same, but typically we academicians don't share our knowledge with other academicians across campus. In the past, we lacked a common platform for sharing our common knowledge, so each discipline had to rediscover the lessons that other disciplines had already learned. The transdiscipline of Informing Science provides this needed platform to bridge and cross-pollinate the disciplines that use IT to inform their clients. This paper discusses this emerging transdiscipline: its rationale, framework for understanding, journal, and conference activities.

#### **605 The Evolving Role of Faculty: Traditional Scholarship, Instructional Scholarship and Service Scholarship**



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Faculty workload decisions made by a departmental unit often create a conflict for faculty because promotion/tenure decisions usually focus primarily on individual scholarly achievements. This paper describes an approach to faculty evaluation that considers both departmental and individual needs by expanding the view of scholarship to include Research, Instruction, and Service.

#### **606 IS Grows Up and Leaves Home: Situating Educational Programs in the Information Society**

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The pervasiveness of computers in modern life has created a need for greater diversity in the educational frameworks for information technology education. We describe a new educational framework (a Bachelor of Science in Information Science) developed at Northeastern University, which focuses on the relationships between information, technology and users, and encompasses today's diversity of application domains. The framework focuses on the design and use of information systems within a science-oriented education paradigm, as contrasted with the professional education offered in schools of business administration. It includes a strong background requirement of technical courses in computer science, along with a strong background requirement in behavioral/ social science. It also addresses the wide variety of domains and contexts in which information systems are now used, including but not limited to business. The study of empirical research methods give students the ability to conduct objective, systematic evaluation of the usability and/or impact of information technology, while an experiential learning requirement enables students to apply their classroom knowledge and skills in relevant productive work. Assessment of learning outcomes is one of the challenges we face as the implementation of the program proceeds.

### **607 Evaluating Informational Tool Building and Utilization as Applied Research**

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The advances of technology have altered the research theater and compelled information scientists to develop appropriate criteria for evaluating contemporary research. While classical scientists may not embrace these new research paradigms, they eagerly seek the tools created by information scientists that often enable and extend research to levels not otherwise possible. Informational tools include a broad range of hardware, software, survey instruments and other methodologies which are the object of research or are created to enable research in information and other sciences. The process of building and using informational tools has been presented to the scientific community as valid research in its own right. Rapid technological growth and societal demands for fast solutions to important problems require a progressive view of research and the establishment of criteria by which all scientists will recognize, support, and fund research in informational tools. This paper reviews the role of information science as a creator and

user of informational tools. It attempts to rationalize the process of informational tool building and utilization in relation to the strict criteria of the scientific method. Using a model developed for artificial intelligence, criteria are suggested for evaluating applied research in informational tool building and utilization.

### **608 Creating Real-Life Project Opportunities for Systems Analysis and Design Students**

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One of the responsibilities of MIS faculty today is to prepare our students for entry-level positions where the working environment requires a variety of technical, behavioral, and communication skills. The purpose of this paper is to share how MIS faculty members at a small liberal arts college created partnership opportunities with various on-campus entities and non-profit off-campus organizations to present real life projects for the students in their systems analysis and design course. These partnerships are especially crucial for a college that are located in a town of only 8,000 people where opportunities for information systems (IS) projects are not in abundance. Through our partnerships, we found our students to be more engaging in class; they ask better questions and connect better with the concepts presented in class. As faculty members, we have learned to maintain existing partnerships and to cultivate new ones. And for our "clients," they are eager to work with enthusiastic and dedicated young MIS majors to address their IS needs.

## 609 Information Security Educational Initiatives to Protect E-Commerce and Critical National Infrastructures



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The number of skilled practitioners of information system security who are able to address the complexities of large, interdependent systems is very small. By moving to an educational system that cultivates an appropriate knowledge of security, we can increase the likelihood that our next generation of Information Technology workers will have the background needed to design and develop systems that are engineered to be reliable and secure. This paper describes current specific educational initiatives designed to facilitate information systems security education. We close with our own recommendations for facilitating information system security education based on similarities between the different initiatives.

## 640 Re-examining an Existing Information Systems Management (ISM) Degree Program for Adult Learners



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Derek Leebeart has written, "Everything is being melted in the furnace of the new." We interpret this to mean that the increasingly rapid pace of development of new information and telecommunications technologies and their incorporation into everyday life is bringing about a very strong paradigm shift in the way

people work, live, play, learn and interact with one another. This, in turn, requires new ideas about education, teaching and learning. In this light we plan to re-examine the ISM curriculum currently being offered at the College of Professional Studies (CPS) at the University of San Francisco (USF) to ensure that it is: 1. Consistent with the needs and learning practices of working professionals. 2. Consistent with the definition of information systems management as a highly specialized, complex, rapidly changing discipline that encompasses computer and telecommunications technology plus the people, processes, resources, facilities, and underlying mechanisms necessary to improve organizational performance and competitiveness. 3. Congruent with the latest generally accepted guidelines and recommendations for Information Systems course content. 4. Providing appropriate technological and 'soft skills' tools, training and education. 5. Including a proper respect for ethical and social issues arising from the use and development of information technology. 6. Incorporating opportunities for community service and support into the program. This presentation reports on the history of this program, its current status, recent curriculum changes, and our immediate and 2 – 3 year plans to review it in accordance with the criteria listed above.

## 680 Seminar: National Science Foundation Funding Opportunities for Undergraduate Computer Science and Information Systems Faculty

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# Track: Women and Minorities in Computing

## 700 An Exploratory Study of the Representation and Performance of Females in Information Technology at Murdoch University



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This paper presents some preliminary statistics about male and female entry, persistence and success rates in Information Technology courses at Murdoch University. The figures show that, like other countries, females make up only a small percentage of the overall student body in these courses. Further, they show that females have the same persistence and success rates as males, and that in some cases females perform better than males. Finally, the paper discusses further research that could be considered in this area.

## 701 Bridging the Supply and Demand Gap in IT: Strategies for the Recruitment and Retention of Women and Minorities

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Research eliminates any doubt that women are as prepared and capable of succeeding in IT as men. To meet our future technol-

ogy work force demands, we must attract more students into the field of technology, both male and female. Statistical projections suggest that if equal representation could be achieved, our critical IT shortage problem would be significantly relieved; therefore study must continue until equality of representation exists. Two major focus points exist in achieving equal representation: (1) the recruitment of females to major in technology disciplines; and (2) the retention of females in the technology disciplines, once the initial choice is made. This paper will present the efforts of two universities toward these goals of recruiting and retention.

## 740 Mentoring First-Year Female MIS Faculty: Reflections on the Past Year

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The key question from new teachers is usually "When will I know that I am good enough?" The purpose of this paper is to share the mentoring of a first-year female MIS faculty at a small liberal arts college during the past academic year. Two key mentors, both male, are from the computer science and management information systems disciplines respectively. The first-year faculty member was also able to tap the support of other faculty members from other disciplines. The two key mentors were able to give this first-year MIS faculty diverse opinions and perspectives on different academic and self-development issues. Perspectives and lessons learned by the new faculty and the MIS mentor also are presented in this paper.

## Track: Human Factors

### 800 Web Groups: A Collaborative Study of IT Mentoring for Students from Regional Universities and Rural Communities



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The role of the University is being expanded to address job issues faced by upperclassmen majoring in Computer Science and Computer Information Systems. Two Oklahoma universities are collaborating to meet student needs using an Internet interface. Faculty in the programs at both universities recognized a need to help their students develop an awareness of today's workplace environment. The solution was a web-based electronic interface and meeting site. As a cooperative endeavor between two geographically challenged state schools, it has also helped students begin to network with their future IS professional peers.

### 801 IS Ethical Attitudes Among College Students: A Comparative Study



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The latest rash of virus and worm attacks has increased public awareness concerning unethical and criminal actions that result from the use of computers. To increase ethical behavior when using computers, educators have to raise the level of ethical awareness of professionals and future IS professionals. This paper reports on a study to compare the attitudes regarding IS ethics among college students. The results are based on the responses of 712 students toward ethical situations of 20 individual situations in 16 scenarios. They show that there is a difference in attitudes as students mature through the educational process in 12 of the 20 individual situations and between genders in 8 of the 20 individual situations.

## Track: Student-Faculty

### 900 Migrating a Traditional Network and Data Communication Laboratory Course to an Information Systems-Friendly Environment



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Networking and data communication have become more prominent in the information technology arena over the past ten years. Graduates of Information Systems or Computer Science programs should possess some competence in this computing sub-discipline. However, many universities opt to exploit resources and find synergy between the Computer Science and Information Systems curricula where possible. We present an approach to teaching the subject that gives students a rich set of laboratory experiments and yet is appropriate for both the Information Systems and Computer Science curricula. Our approach gives students access to the implementation detail of data communication protocols in an NT/Visual Basic programming environment that is friendly to Information Systems.

### 901 Enterprise Development Technologies and E-Commerce

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This paper contains excerpts from three distinct papers written during an independent study course. This course was intended to research enterprise technologies including Java, JINI, and LDAP. The focus of the majority of the research is the area of E-Commerce and how these technologies can be used and exploited for the purpose of E-Commerce. The project will also delve deeply into design strategies for a completely modular and flexible system. Its purpose will be to show how enterprise technologies being used today and in the future can be integrated to allow organizations to conduct business transaction over a public network (the Internet).

## **902 Electronic Versus Paper-based Testing in Education**

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The introduction of computers into classrooms has provided most educators with the ability to use computer-aided, electronic tests for their students. However, there are issues and concerns related to computer-aided tests, which have a different look and feel (interface) in comparison to the standard paper and pencil format used in past years to test student knowledge. Instead of a number 2 pencil and a bubble sheet, students today are often presented with a monitor and a mouse in the computer-based testing (CBT) environment and asked to submit answers with a click of the mouse while reading questions on a computer monitor. Questions concerning validity and the reliability of computer-aided tests will be discussed as well as electronic testing trends.

## **903 Can We Make Better Use of the Educational System to Solve the Information Technology Staffing Problem?**

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This study investigates whether we can use the secondary and post-secondary educational system to solve the IT staffing problem. In order to reach this determination, the study performs a review of the literature. This study is limited in scope to secondary and post-secondary academic institutions located within the United States. This study will use information gathered from various academic institutions such as the Information Technology Association of America (ITAA), the Applied Information Management (AIM) Institute, and the Detroit School of Industrial Arts (DSIA). Within the ITAA, the School-to-Career (STC) program will also be examined. In determining solutions to the IT labor shortage, this study will investigate the level of cooperation that must exist between academia and industry in order for a solution to be achieved. Finally, this study will touch on whether the cooperative solutions that are derived from the cooperation between academia and industry are slanted towards the larger corporations. This is occurring because the smaller corporations do not have the available resources to share with various academic institutions. This results in a solution to the problem that is skewed towards the larger companies. This study concludes that further research must be done in order to determine which of the proposed solutions will have the greatest impact on solving the IT labor shortage, however, it is apparent that any solution must involve industry and academia working together.

## **904 Information Literacy and IT Competency in the Information Age: A Critical Overview of Corporate IT Education Sourcing**

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Many companies desiring or compelled to join the information revolution are wondering whether they possess the wherewithal to accomplish the feat. Beyond the purely technical issues there exists the broader challenge of adapting their organizations to new business and information paradigms. A similar challenge faces

firms that have already made the transition, because constant change seems an inescapable fact of life in the information age. This paper briefly examines (from a “macro” perspective) current education and training sources—including degree-based programs, corporate universities, and training vendors—designed to help companies attain (and maintain) this crucial information technology (IT) competency. Our purpose is to assess the relative effectiveness of these alternatives, especially in terms of a core determinant of organizational IT competency at the employee level: information literacy. This refers to a mixture of IT knowledge, skills, perceptions and values that determines an individual’s IT perspective. In our scheme it is composed of two fundamental areas, which we call technical literacy and business literacy. This framework leads us to identify inherent weaknesses (and some strengths) in the various IT education approaches. We also conclude that the IT education and training scene as a whole suffers from fragmentation and inconsistency. Our evaluation argues for a more integrated and cooperative approach involving the major players in the IT education market, one that in fact may just be starting to emerge.

### 905 MIS Curriculum Evaluation: A Methodology for Ongoing Web-based Alumni Assessment



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Information systems curricula at schools of higher education are constantly under pressure to update curricula to reflect current industry trends. This pressure comes from knowledge of industry expectations, requirements of accrediting bodies to provide evidence that graduates are provided with necessary knowledge and skills opportunities, and self-imposed expectations of IS faculty to prepare graduates for future employment. This paper adds to the body of research by introducing a mechanism for ongoing curriculum assessment by information systems alumni. The study involves conversion of a previously paper-based survey

to a secure web site designed to capture alumni curriculum perceptions following a one-year period of employment.

### 906 In the Fast Lane: A Study of Online Learning at Ontario Universities

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In order to find out how Ontario universities were doing in their process of moving into the Information Superhighway, a study was conducted by visiting their Web pages. Those in the fast lane, at the graduate level have already incorporated some strategies to help them succeed in the new economy, either by forming alliances with other universities or with private enterprises. At the undergraduate level there are still plenty of opportunities that they have not cashed on yet.

### 907 A Study of the Differences Between Educational Standards and Vocational Demands in the MIS Field

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The rapid pace change and growth of Management Information Systems in recent years has apparently created a gap between employer and educational institution. The research question to be addressed in this paper is what are the differences between the educational standards and vocational demands in the MIS field. More specifically, colleges and universities teach lessons to their students. Once in the working environment, however, these new

employees often find themselves in unfamiliar territory. One reason is because schools normally concentrate on the theoretical side of education. Quantitatively, this analysis compares what a number of newly graduated students in the information systems field know with what they needed to learn after they were able to secure employment. Qualitative analysis of the above questions involved creating and distributing open-ended surveys to investigate some of the differences between the demands made by employers as to what they require from their starting employees and what various schools are currently providing. This is a pilot study that could be expanded to include instructors, employers and other professionals in the area.

### **908 Some Observations on Web-based Course Delivery at Historically Black Colleges and Universities**

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The delivery of educational programs has evolved dramatically. Distant delivery of educational programs was made possible by the invention of the printing press. The printed book provided an inexpensive media to disseminate knowledge to the masses. In later part of the 20<sup>th</sup> Century, radio and television were also used for broadcasting educational programs. Internet-based course delivery programs were introduced recently and this innovation has brought about a new challenge to the concept of educating the masses. This study identifies the availability of Internet-based course delivery programs at selected MOLIS institutions. Specifically, this research examines the type of courses available, degree program offerings, tuition cost, and selected demographic information of those institutions. The results of this study should be of interests to administrators at institutions considering Internet-based course delivery programs, faculty members developing Internet courses, and reviewers from accreditation agencies. Human resource managers seeking flexible courses for the professional development of employees, individuals looking

for specific distant delivery courses and degree programs, students requiring access to non-traditional educational programs, and the handicapped needing academic programs that can be completed at home will find this study useful. In particular, researchers, legislators, and consultants of minority institutions will find the results of this study significant.

### **909 Some Observations On Internet Addiction Disorder Research**

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Internet addiction is a contemporary problem brought about by easy access to computers and online information. Individuals addicted to the Internet can develop many types of disorders. In extreme cases, persons addicted to the Internet may be destructive to themselves, their families, and their place of employment. Corporate executives need to have a better understanding of Internet addiction because employees with Internet addiction can be highly counter-productive as well as cause other legal problems. This study examines research trends in the area of Internet addiction and provides management implications for policy development and planning. Specifically, this study identifies the leading researchers, institutions, specialization, and information dissemination outlets for Internet addiction research in the last quarter of the 20<sup>th</sup> Century to the present. This study should be of interest to educators at academic institutions, students interested in institutions offering Internet addiction courses and programs, and researchers specializing in online addiction studies. Clinical

psychologists, behavioral counselors, psychiatrists, clergy, and addiction therapists will find the results of this study useful. In particular, corporate attorneys dealing with addiction cases, human resource specialists seeking rehabilitation facilities for addicted employees, health related policy makers, computing consultants, and risk assessors of insurance companies will find the results of this study to be valuable.

## 910 Some Observations On Web-based Recruitment By Selected Fortune 500 Companies

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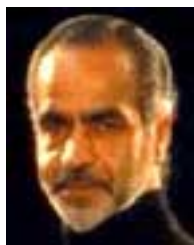
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Irrespective of size, industry, or location, companies and institutions are experiencing difficulty with recruiting and retaining qualified information technology professionals. To cope with the problem, companies and organizations are utilizing a variety of methods to gain access to prospective candidates. The Web has become one of the popular methods for recruiting talented individuals who are skilled in the area of computing and information technology. This study examines the use of Web technology by selected Fortune 500 companies to recruit computing and information technology professionals. Specifically, this research project identifies the type of employment information and methodologies that are included in the web sites of Fortune 500 companies. The results of this study should be of interest to personnel managers, Web-site developers, systems analysts, placement agency managers, consultants, legislators, immigration attorneys, and individuals responsible for generating governmental labor reports. Graduates seeking jobs, individuals looking for advancement, career counselors, computing and information technology faculty members, and researchers involved with Web-based recruiting and effectiveness will also find this study useful.

## 911 Prototype Web-based Database for Student Registration System

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Student registration systems that are in place at many universities require students to come to the campus and register for respective courses. Such systems put strain on the computing and human resources available at educational institutions. Some of the problems that are inherent to these systems include time consumption in the registration process, pooling of computing and administrative departments, and an acute increase in the staff requirements to complete the registration process in a short span of time for all students. This project concentrated on the development of a Web-based student registration system that would alleviate the inherent problems by providing an efficient, fast, and effective registration process that is accessible through the Internet. Several advantages can be realized from this prototype. All the administrative departments involved in the registration process can integrate their functions to provide a comprehensive process that would enable the student to register for courses, pay the fees, and get the financial aid based on the eligibility. The prototype developed in this project provides an additional option of posting grades of the students on the University's Web site, thus enabling the students to view their grades without having to come to the campus or access any cumbersome telephone-based processing systems. The full-scale model of this prototype will support students, administrative staff, and faculty of any educational institution in managing their time and resources effectively through on-line communication.

## 912 A Graphical Interface to Multi-tasking Programming Problems

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The foundation of this project lies on the basis of the multi-tasking environment, at the operating system level. An important consideration taken into account is the ability to run platform-independent programs using a common graphical user interface. The application (named 'RunApp') is developed using Microsoft Visual Basic. It is based on the concept of linear programming in a multi-development environment. Currently, this application incorporates the Visual C++ and Visual Basic programming environment by providing editing, compiling, and execution capabilities. RunApp possesses the capability of searching web-oriented resources, which will aid developers to find information about different environments through the Internet. This tool will also help the developer in downloading and updating the latest controls, modules, DLLs, etc. directly into their respective environments such as Visual Basic or Visual C++. This application provides all the editing features of any basic word processor. RunApp shares the personality of a development environment, debugging tool, information access, and application execution module. It is a standalone interface that couples multiple programming environments into one entity with capability of multi-tasking.

### 913 Development of Essential Features for a Human Resource Management System

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A Human Resource Management System (HRMS) is the core of any successful organization. It is the centralized repository for all the critical data needed for administrating a workforce. An efficient HRMS, besides managing employee records, transforms an impersonal "company" into a trusted employer. As a company grows, traditional methods for addressing employee information needs usually result in a haphazard combination of paper and computer-based systems. In many cases, these systems are redundant and non-communicative. This results in inconsistent

information and costly duplication of effort. The present system, HUMAN RESOURCE MANAGEMENT SYSTEM (HRMS), is built in an industry-standard client/server environment to alleviate these problems. It allows the personnel department to perform the tasks of storing, retrieving, and processing personnel data such as payroll and time reporting as well as generating managerial reports in a timely fashion. The HRMS is also in compliance with all government and corporate requirements. The system employs specialized input and maintenance programs along with a generalized robust data management that is user-friendly. It uses the Sybase's "SQL Anywhere" relational database on the server side and open-ended, object-oriented PowerBuilder on the client end.

### 914 Smart Cards in Europe and the United States: Old World vs. New, and Which is Which?

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This paper focuses on one specific form of information technology, the smart (chip) card. Smart cards involve a variety of issues of varying complexity and scope, as evidenced by the experiences of the countries who have employed the cards. However, the European acceptance of smart card technology is far greater than that of the United States. This paper examines the rapidly emerging and developing market for smart card applications, specifically in comparison to its use in Europe and United States. In this paper, the emphasis is on the various applications and market factors related to the use of these cards. Our discussion will focus primarily on smart card technology in the form of a credit card-sized mechanism. However, the technology could be applied to a wide variety of common items. These could potentially include a key chain, a decorative pin, a locket or a belt buckle. In fact, most anything found in a person's wallet could, and potentially will, be stored on a smart card including "driver's license, insurance information, credit cards, bank accounts", various other forms of identification. For this reason, IT students benefit from at least a rudimentary understanding of the potential impact and use of smart card technology.

## 915 Developing Adaptive Intelligent Tutoring Systems: A General Framework and its Implementations

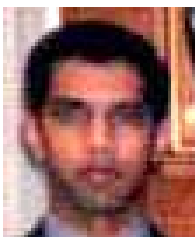
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Web-based training is increasingly gaining popularity both in industry and education. Although a number of studies, experiments, and developments have been conducted in this area, few evidence cases of success have been reported. One likely reason for the lack of success is that just placing lecture notes on the web does not train. This situation can be improved through the use of training software such as Intelligent Tutoring Systems (ITS). ITS incorporate built-in expert systems in order to monitor the performance of a learner and to personalize instruction on the basis of adaptation to learners' learning style, current knowledge level, and appropriate teaching strategies. However, researchers and developers quickly find out that developing such systems is an enormous task, which is further complicated by the fact that one cannot simply borrow tools from other systems and incorporate them due to various levels of incompatibility at the programming and knowledge base level. To allow for more general ITS, which means that it can be used in other domains, it is required that ITS should be designed and implemented so as to support easy modification of lecture content, modification of decision rules in the expert system, and to support various methods to measure the performances of learning. In this paper, we propose a general framework and data model for web-based adaptive ITS that allows knowledge to be stored in such a way that is not only independent of the knowledge domain, but also supports the storage of transfer knowledge relationships and prerequisite knowledge relationships. We expect that our unified approach could contribute to the establishment of cumulative research traditions in ITS studies.

## 916 A Virtual Classroom to Teach Hindustani Music



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The East Indian Music Academy's Elementary Hindi course is designed to teach students the fundamental terminology used in classical Indian music. In addition, students learn how to pronounce music notes and sing Hindi songs. To determine the effectiveness of an online Elementary Hindi course, a small research project was devised and conducted. Eighteen students participated in this study for two weeks. Nine students took the course online and nine students took the course offline. Every student took a written test before starting the course. All students took four written exams during the course to determine their mastery of the theoretical material. Students were required to learn to sing any two of five classical Indian songs in Hindi. The instructor tested the students' practical knowledge by having all students sing the songs to him either in person or over the telephone. The results indicated that online students outperformed offline students on both the written and oral test measures, but there were shortcomings in the methodology.

## 917 Verification of a Predictor for Performance of Computer and Information Science Students in a Problem-Solving Course

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The development of a simple 4-question tool predicting performance of computer and information science undergraduate

students in a gateway problem-solving course was reported at ISECON 99. This paper reports the results of a second-year study, confirming that the predictor provides a useful correlation with the course final grade (Pearson  $r = 0.322$ ). In addition, this follow-on research further suggests that stronger enforcement of course prerequisites in Fall 99 (7.8% increase in MATH ACT; 190% increase in precalculus) resulted in a 5.5% increase in predictor test score, and a 16.5% increase in final grade.

## 918 Application of Bloom's Cognitive Domain Taxonomy to Database Design

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Database System Design is a required course is nearly all undergraduate Computer Science and Information Systems curricula. We reflect upon a critical re-examination of our teaching of such a course in Database Design, invoking the tiers of learning espoused by Bloom, and propose some recommendations in light of desired levels of thinking skills and the availability of recently developed software applications, which, when properly invoked, engage our students in a broad range of learning activities, from the base level of knowledge attainment, to the transforming of students into dual roles as teachers of database topics, enabling them to reach the highest levels of learning.

## 919 Course Technology and Online Education: A Study of the Impact on Student Learning



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This paper describes a quantitative study on the use of course technology/online education to enhance student learning. The objective was to study the effects of using course technology/online education upon the success and learning of undergraduate students in a particular course. The course, Fundamentals of Programming, was taught over the course of 4 semesters and 75 students were evaluated. The course takes place in a hands-on lab classroom. The Fall Term A and B semester courses did not use the technology and the Spring Term A and B semester courses did. All students in both courses were given the same in-class instruction and the same number of similar assignments. The two research questions are: (1) What is the comparison of student grades and course completion between the Fall semester course without course technology and the Spring semester course using course technology; and (2) Do student grades correlate with access and usage of course technology during the Spring semester course?

## 940 Experimental Learning: Competitive Intelligence, Knowledge Management, and Technology Transfer

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The academic Information Technology (IT) curriculum is evolving to respond to the globalization and diversification of information space. IT educators continue to (1) expand traditional definitions of information work and (2) offer courses and opportunities for experiential learning that extend beyond the boundaries of contemporary use of IT. This is key to the continued long-term relevance of IT programs in traditional academic institutions. This paper presents a discussion of competitive intelligence (CI) education embedded in one university's IT program. Focus is placed on the student's (co-author Doug Adams) experimental learning activity implemented by his field experience in a nearby technology transfer center that integrated course content and business objectives with particular emphasis on adding value to the technology transfer process itself. Despite the existence of innovative CI software, such applications have not traditionally been part of the basic IT curriculum. That is why the use of technology transfer centers provides a good substitute. This paper concludes with a discussion of the resulting benefits to the student, to the institutions involved and to the technology transfer process as a whole. These benefits were the direct result of this student's subsequent engagement in independent problem-solving activities that grew out of his experiential learning activities.

**960 Network Security Among Four-Year Colleges**

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**961 Developing and Implementing a Meaningful Project Using Group Support Systems (GSS) in a Special Topics (Groupware) Course**



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**980 Seminar: The Role of Information Systems Departments in Today's Organizations.**

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# Colophon

The ISECON 2000 Proceedings were produced from author-provided source documents in Microsoft Word format. Title, authorship, and abstract were collected into an Adobe PageMaker document and combined with digital pictures. The pictures are predominantly .jpg images with some .gif and other images. These were edited using Adobe PhotoShop (limited edition) to provide uniform sizing color balance, and contrast. The predominant font is Times New Roman.

Paper numbering reflects the track in the first digit, and the type of paper in subsequent digits, as follows:

- 00-39 are full (eight-page) papers (there are 95)
- 40-59 are (four-page) works in progress (there are 23)
- 60-69 are abstracts only (there are seven)
- 70-79 are panel discussions (there are eight)
- 80-89 are seminars (10) or workshops (1)
- 90-99 are "Birds of a Feather" discussion groups (1)

The accompanying CD-ROM contains the original author's full text of each paper in .doc format (Microsoft Word) or .rtf (rich text format), and in one case an ancillary .ppt file (Microsoft PowerPoint presentation). For maximum portability and interoperability across computing platforms, now and in the future, the papers were also converted into .txt format (ascii text), .ps format (PostScript), and .pdf format (Portable Document Format, read by Adobe Acrobat Reader). The CD-ROM was mastered on a Linux (Red Hat 6.2) workstation using the "cdrecord" suite of tools.

# ISECON History

The first ISECON, titled as the "National Conference on Information Systems Education sponsored by the DPMA Education Foundation" was held from March 22-24, 1982 at the McCormick Inn in Chicago. Below is a complete list of all past ISECON years and locations.

Year	Number	Location
1982	1st	Chicago, IL
1983	2nd	no record
1984	3rd	no record
1985	4th	Houston, TX
1986	5th	Atlanta, GA
1987	6th	San Francisco, CA
1988	7th	Dallas, TX
1989		Not Held
1990	8th	Chicago, IL
1991		Not Held
1992	9th	Nashville, TN
1993	10th	Phoenix, AZ
1994	11th	Louisville, KY
1995	12th	Charlotte, NC
1996	13th	St. Louis, MO
1997	14th	Orlando, FL
1998	15th	San Antonio, TX
1999	16th	Chicago, IL
2000	17th	Philadelphia, PA
2001	18th	Cincinnati, OH

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## See you at



## Oct 25--28 Cincinnati

# Notes: