



# CHANNEL

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## Teichroew Speaks at Associates Meeting



A large group of faculty, students, and MIS executives attended a lecture given by **Dr. Daniel Teichroew** at the Graduate School of Management on Friday, June 8, 1979. Dr. Teichroew's address was the focus of the Spring Meeting of the Computers and Information Systems (C.&I.S.) Associates, a group of senior MIS executives who actively support the C.&I.S. program at UCLA. Dr. Teichroew is a Professor of Industrial and Operations Engineering at the University of Michigan where he is also Director of the well known Information System Design and Optimization System (ISDOS) Project, which has developed PSL/PSA, a computer-aided tool for the specification and documentation of information systems requirements.

Dr. Teichroew's lecture focused on productivity in the development of computer software. He cited examples of the poor reputation of system development efforts throughout the data processing industry. He reviewed several projects that have unsuccessfully attempted to use productivity as a basis for estimating project costs and schedules. He concluded that, although there are currently no good ways to measure system development productivity, there are nevertheless several approaches for attempting to improve it. These include improvements in the organizational structure, improved management of the systems department, increased investment in tools, better worker motivation, more extensive use of computer-based support systems, and finally a technological breakthrough.

The PSL/PSA package (standing for Problem Statement Language/Problem Statement Analyzer) was presented as an example of how the investment in development tools can result in appreciable productivity improvements. He reported on a student project which

successfully specified a county court information system in a relatively short period of time using the PSL/PSA software. In general, information system design projects involving students at the University of Michigan and several other universities confirm the value of computer-aided tools with regard to improving design productivity. In response to several audience questions, Dr. Teichroew reported on the wide use of PSL/PSA among a number of commercial enterprises. Although these companies are reluctant to provide data on their productivity improvements, Dr. Teichroew claims that the increased use of PSL/PSA is in itself evidence of its cost effectiveness.

Dr. Teichroew concluded that more research is required to determine the best way of improving—and measuring—software development productivity. He also indicated that investigation into the relationships between the characteristics of the process and the characteristics of the product was another major area meriting further research.

Prior to Dr. Teichroew's address, the C.&I.S. Associates and C.&I.S. faculty and doctoral students attended a session on current MIS research activities at UCLA. **Professor Peter Chen** discussed the Entity-Relational (E-R) approach to the design of information and data base systems. The E-R approach, developed by Dr. Chen, focuses on the entities and relationships that are important to a company and which describe how it functions. He also reported on the research being conducted at other research facilities and corporations using the E-R model.

**Professor Bennet P. Lientz** reported on a recent research study on software maintenance conducted by **Pro-**

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# Focus on C.& I.S. Associates



**Dr. William H. Taubert**, Vice President of Logistics for Hunt-Wesson Foods, and a UCLA/GSM alumnus is one of the "new breed" of executives to emerge from the ranks of computer management. Ten years ago he graduated from UCLA with a Ph.D. in Operations Management and joined Hunt-Wesson Foods as Director of Information Systems and Services.

His budget responsibility was then \$3 million, and he had 30 people in his organization. Today, his budget responsibility is one-quarter billion dollars per year, and he has responsibility for Purchasing, Distribution, Sales Forecasting and Inventory Control, Facilities, and, of course, Management Information Systems. It is not surprising that he was one of the first corporate executives to pledge his support to the new C.&I.S. Associates Program. Dr. Taubert characterizes the C.&I.S. Program as an exciting innovation—one which will be significantly beneficial to the students, the faculty and the data processing practitioners from industry. In short, he feels it is the right program, at the right school, at the right time, with the right leadership.

Dr. Taubert's educational background and work experience reflect his diverse interests which range from textbook author to company president and from electronics engineering to human relations. A native of New York, he received a Bachelor's degree in electronics from RPI, served as a Naval officer on a minesweeper in the Far East, received an MBA from Harvard Business School and held several executive positions at Hughes Aircraft. It was at Hughes in the early 60s where he concluded that computers offered the greatest potential of all to business in the integration of corporate information flows, as compared to solving specific engineering problems. This interest led to UCLA and a close association with Dr. Elwood Buffa of the Operations Management Department.

Dr. Taubert received his Ph.D. (with distinction) in 1968. During the 1967-70 time period, he authored several articles which appeared in T.I.M.S. and MIT's Industrial Management Review. In addition he contributed to the Wiley-Interscience text, *Case Exercises In Operations Research* and co-authored with Dr. Buffa, the widely used Irwin graduate text, *Production-Inventory Systems: Planning and Control*.

Dr. Taubert is a strong supporter of GSM. For example, during his first month at Hunt-Wesson he recommended Dr. Geoffrion, a former professor, as one of the few individuals in the United States who could rigorously determine the company's optimal (least cost) nationwide distribution system. Professor Geoffrion accepted the challenge and the rest is history. Dr. Geoffrion

is now considered to be one of the world's foremost experts on macro-system optimization, and Hunt-Wesson, according to a recent Harvard Business Review article, achieved annual savings "in the low seven figures." Dr. Taubert also mentioned that the broad spectrum of required UCLA courses, that no one appreciated at the time, came in very handy when he was asked to step in as president of an ailing computer services company which was owned by Hunt-Wesson's parent company. This assignment lasted one year and during this time the \$20 million Iowa based company was turned around and sold at a profit.

At the present time, Dr. Taubert is active in several professional associations including the Grocery Manufacturers of America and the National Council of Physical Distribution Management. Additionally, he participated in the development of the universal product code for the grocery industry and now serves on the Universal Product Code Council which guides its implementation throughout the industry. He was also one of the first GSM Firm Night speakers.

Dr. Taubert left no doubt that he firmly believes that UCLA is one of the truly great educational institutions of the western world. He feels that given the talent and motivation of the GSM faculty and students, plus the "margin of excellence" funding provided by the C.&I.S. Associates and other programs, it is only a matter of time before GSM will be recognized as the leading business school in the United States. □

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## Cooper Receives IBM Fellowship

**Randy Cooper** was chosen as the Computers and Information Systems IBM Doctoral Fellow for 1979-80. The IBM Fellowship, first awarded in 1977, provides support for a C.&I.S. student who is at the dissertation stage of his or her doctoral program. The fellowship provides tuition and fees as well as a quarterly stipend. As a result of this financial support, the student is able to concentrate directly on research, without the need to seek out part-time employment.

Randy Cooper received both his A.B. in Economics and his M.B.A. from UCLA. During his masters studies, he received the Edward W. Carter Fellowship (awarded to the top two percent of the graduating class) and was elected into the graduate business honor society Beta Gamma Sigma. Upon graduation, he accepted a position with the Computer Sciences Corporation as a systems analyst and was involved with the development of Orange County's justice information system. In the winter quarter of 1976, he entered the Graduate School of Management's doctoral program, concentrating in computers and information systems. He has passed his major field exams and expects to receive his Ph.D. in September 1980. □

# Colloquium Series

The C.&I.S. Colloquium Series continued with five regularly scheduled presentations during the Spring Quarter.

The first colloquium was given by **Ronald S. Lemos**, a recent graduate of the C.&I.S. doctoral program and currently an Associate Professor of Business and Economics at California State University, Los Angeles. The title of Professor Lemos' presentation was "Structured Walk-Throughs and COBOL Programming: Cognitive and Attitudinal Effectiveness." The presentation described an experiment that empirically assessed the effectiveness of structured walk-throughs in teaching introductory COBOL Programming to a large number of undergraduate business majors. Students who were taught COBOL using the structured walk-through approach were significantly better at writing, reading and debugging programs than the students who were taught using the traditional lecture/lab approach. However, the students taking the traditional programming course rated their instructor more highly.

The second colloquium was delivered by **Professor Judea Pearl** from the School of Engineering and Applied Science at UCLA. He was assisted by **Mr. Antonio Leal** from Perceptronics, Inc. The title of their presentation was "Domain Independent Decision-Aiding Systems." Through lecture and slides, the speakers presented a computer-based decision-aiding system that they developed and tested with business executives. The computer system uses an English-like language and terminal display graphics to lead a panel of business experts through a decision process. The system identifies the decision alternative with the highest expected payoff based on the assumptions, probabilities and events submitted by the experts. While leading the panel through the decision process, the system attempts to resolve issues involving significant discrepancies in input values.

The third colloquium was entitled "An Approach to the Office of the Future" and was presented by **Mr. James C. Norton** of Tymshare, Inc. Mr. Norton described an advanced office information system named AUGMENT. He outlined the features which provide for integration of multi-functional tools and for coherence in command languages and he discussed some of the experiences in moving such a system into organizations.

The fourth colloquium, "Problem Factors and Determinants in Application Software Maintenance," was presented by **Professors Bennet P. Lientz** and **E. Burton Swanson** of the Graduate School of Management. Professor Lientz described the survey questionnaire on application software maintenance that was completed by 487 data processing organizations affiliated with the Data Processing Management Association. He presented several of the survey questions with a breakdown of the responses to each question. Professor Lientz related some of the responses to his experience as Director of UCLA's Office of Administrative Information Services and offered interpretation of the results. Professor Swanson described the analysis performed on the data collected in the survey, and reported on some of the important results. Factor analysis was applied to the data in order to single out factors underlying the problems in

applications software maintenance. Among the problem factors identified were user knowledge, programmer effectiveness, product quality, programmer time availability, machine requirements, and system reliability.

The final colloquium was given by **Martin L. Bariff**, a visiting Assistant Professor at the Graduate School of Business of the University of Chicago. His presentation was entitled "Study of EDP Auditor's Evaluations of Internal Controls." The study compares the evaluations of internal EDP controls for 35 cases within a specific business setting among 25 auditors from a local chapter of the EDP Auditors Association. The study analyzes consistency between auditors and the effect of general audit experience versus data processing experience.

The Colloquium Series will not be held on a regular basis during the summer, but will resume its usual schedule during the Fall Quarter. The first colloquium will be scheduled for the last week in September or the first week in October. Announcements will be distributed prior to the first lecture in the fall. □

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## Teichroew . . . Continued from page 1

**Professor E. Burton Swanson** and him. The project involved surveying 487 organizations affiliated with the Data Processing Management Association on their system maintenance experience. Dr. Lientz highlighted the findings of their study. This second presentation provoked spirited response from the Associates. They seconded the need for detailed analysis of user requirements; the importance of building flexible systems; the need to establish a proper relationship between maintenance requests and available maintenance programmers; and the value of chargeback systems for controlling maintenance requests.

**Professor Ephraim R. McLean**, who was moderating the session, then asked for other areas of research interest from the audience. The Associates identified four areas of current concern. These areas are the recruitment and compensation of competent data processing personnel; the orderly evolution from a centralized data processing operation to a decentralized one; networking, "office of the future," and image processing; and finally the fundamental education of the public with regard to electronic data processing.

The Associates had an opportunity to mingle with Dr. Teichroew and with C.&I.S. faculty and doctoral students at a luncheon prior to the afternoon session and at the cocktail reception held after his presentation.

In attendance were **Pat McNally** and **Doug Cunningham** of Arthur Andersen & Co.; **Jack Murray**, **Bert Jablinski** and **Uwe Michel** of Atlantic Richfield Co.; **Dwight Hanger** and **Jim Savitz** of Ernst & Ernst; **Carl Reynolds**, **Mike Erdei**, **Bruce Peterson**, **Richard Forsey** and **Roger Oertell** of Hughes Aircraft; **Al Colledge** of Hunt-Wesson Foods; **George Widding** of IBM; **DuWayne Peterson**, **L.K. Dorf** and **Norm Liebson** of Security Pacific National Bank; **Jack Gearhart**, **Bob Curry** and **Ronald L'Heureux** of TRW Systems Group and **Bob Foster** and **Jerry Kaminsky** of Xerox Computer Services. □

## Publications (Since June 1976)

1. Neumann, Seev and Barovits, I. *Computer Systems Performance Evaluation*. Lexington Books, July 1979, 139 pp.
2. Mason, Richard O. and Swanson, E. Burton. "Measurement for Management Decision: A Perspective," *California Management Review*, 21, 3, 1979, pp. 70-81.
3. Swanson, E. Burton. "Software Maintenance: A User/Management Tug-of-War," *Data Management*, 17, 4, 1979, pp. 26-30.
4. Allen, R.J. and Lientz, B.P. *Effective Business Communications*, Goodyear Publishing, Santa Monica, California, 1979, 208 pp.
5. Swanson, E. Burton. "The 'Sub O' Approach to Information System Development," *Proceedings of the Twelfth Annual Meeting of the Hawaii International Conference on System Sciences*, Honolulu, January 4-5, 1979, pp. 122-131.
6. Swanson, E. Burton. "The Two Faces of Organizational Information," *Accounting, Organizations and Society*, 3, 3/4, 1978, pp. 237-246.
7. Swanson, E. Burton and Culnan, Mary J. "Document-Based Systems for Management Planning and Control: A Classification, Survey and Assessment," *Management Information Systems Quarterly*, Vol. 2, No. 4, December 1978, pp. 31-46.
8. Swanson, E. Burton. "A Note on Interpersonal Information System Use," *Information & Management*, 1, 6, 1978, pp. 287-294.
9. Lientz, Bennet P. and Swanson, E. Burton. "Discovering Issues in Software Maintenance," *Data Management*, 16, 10, 1978, pp. 15-18.
10. McNurlin, B.C., McLean, E.R., Alter, S.L., and Craft, C.J. (Eds.). *MIS Productivity, Proceedings of the Ninth Annual Conference of the Society for Management Information Systems*, Los Angeles, California, September 1977, 370 pp.
11. Neumann, Seev, Ahituv, N. and Barovits, I. "Selecting a Job Mix for Running a Benchmark by Using an Integer Programming Model," *Computers and Operations Research*, Vol. 5, 1978, pp. 73-79.
12. Neumann, Seev, and Barovits, I. "Internal Pricing for Computer Services," *The Computer Journal*, Vol. 21, No. 3, 1978, pp. 199-204.
13. McLean, Ephraim R. "Organizational and Behavioral Considerations in the Development of Management Information Systems," *Proceedings of the National Conference on Information Systems Development*, The Society for Management Information Systems, University of Arizona, Tucson, Arizona, February 1978, pp. 74-78.
14. Lientz, Bennet P. "A Multistage Model of Network User Behavior," *Proceedings of the National Conference on Information Systems*, University of Arizona, Tucson, Arizona, February 1978, pp. 74-78.
15. Lientz, Bennet P., Swanson, E. Burton, and Tompkins, G.E. "Characteristics of Application Software Maintenance," *Communications of the ACM*, Vol. 21, No. 6, June 1978, pp. 466-471.
16. Allen, J. and Lientz, Bennet P. *Systems in Action: A Managerial and Social Approach*, Goodyear Publishing, Santa Monica, California, 1978, 246 pp.
17. Lientz, Bennet P. and Weiss, I.R. "Trade-Offs of Secure Processing in Centralized versus Distributed Computer Networks," *Computer Networks*, Vol. 2, No. 1, February 1978, pp. 35-43.
18. Swanson, E. Burton. "On the Nature of a Data Base and Its Use in Inquiry: A Tutorial," *Information & Management*, 1, 3, 1978, pp. 95-107.
19. Swanson, E. Burton. "A Methodology for IBIS Data Gathering and Development," *Design Methods and Theories*, 11, 4, 1977, pp. 256-261.
20. McLean, Ephraim R. and Riesing, Thomas F. "MAPP: A DSS for Financial Planning," *Proceedings of a Conference on Decision Support Systems, Data Base*, Vol. 8, No. 3, Winter 1977, pp. 9-14.
21. McLean, Ephraim R. "The Concept of Throwaway Code," *Datamation*, Vol. 23, No. 3, March 1977, pp. 139-144.
22. McLean, Ephraim R. "Automated Medical History Systems," *Journal of Clinical Computing*, Vol. 7, No. 2, 1977, pp. 59-74.
23. McLean, Ephraim R. and Soden, J.V. *Strategic Planning for MIS*, Wiley Interscience, New York, 1977, 489 pp.
24. Lientz, Bennet P. and Weiss, I.R. "The Vulnerability of Computer Auditing," *CPA Journal*, Vol. 11, No. 3, March 1977, pp. 17-21.
25. Lientz, Bennet P. and Arnold, J. "Computer Software Selection—Some Proposed Guidelines," *California CPA Quarterly*, Vol. 45, No. 1, June 1977, pp. 22-26.
26. Swanson, E. Burton. "The Application of Function Descriptors to the Development of an Information System Typology," *Journal of the American Society for Information Science*, Vol. 28, No. 5, 1977, pp. 259-67.
27. Lientz, Bennet P. "Management Evaluation of Network Performance with Security Measures," *Computer Performance Evaluation*, 1976.
28. Swanson, E. Burton. "The Dimensions of Maintenance," *Proceedings 2nd International Conference on Software Engineering*, San Francisco, October 13-15, 1976, pp. 492-497.
29. McLean, Ephraim R. "The Human Side of Systems: The User's Perspective," *27th Annual Proceedings, 1976 Western Systems Conference*, Western Systems Council, Division 22, Association for Systems Management, Los Angeles, California, October 1976, p. 1-A-1, 1-A-6.
30. McLean, Ephraim R. "The Use of APL for Production Applications: The Concept of 'Throwaway Code,'" *APL 76 Conference Proceedings*, Association for Computing Machinery, New York, N.Y., September 1976, pp. 303-307.
31. Swanson, E. Burton. "Information System Approaches: Directions for Research and Practice," *Management Datamatics*, Vol. 5, No. 4, 1976, pp. 155-163.

## Working Papers (Since June 1976) ←

Number	Author	Title	Date
10-79	Randolph B. Cooper E. Burton Swanson	Management Information Requirements Assessment: An Annotated Bibliography	6-79
9-79	Randolph B. Cooper E. Burton Swanson	Management Information Requirements Assessment: The State of the Art	6/79
8-79	Ephraim R. McLean	End Users as Application Developers	5/79
7-79	Bennet P. Lientz E. Burton Swanson	Problem Factors and Determinants in Application Software Maintenance	3/79
6-79	Richard O. Mason	The Office of the Future as a Socio-Technical System	3/79
5-79	Seev Neumann Michael Hadass	Decision Support System—A Solution to the Organizational Problem of Strategic Decision-Making	2/79
4-79	Seev Neumann Eli Segev	User Evaluation of Information Characteristics	1/79
3-79	Bennet P. Lientz E. Burton Swanson	On the Use of Productivity Aids in System Development and Maintenance	1/79
2-79	Lin Gingras Ephraim R. McLean	A Study of Users and Designers of Information Systems	10/78
1-79	Bennet P. Lientz E. Burton Swanson	A Survey on Application Software Maintenance	10/78
4-78	Mary J. Culnan	An Analysis of the Information Usage Patterns of Academics & Practitioners in the Computer Field	2/78
3-78	Bennet P. Lientz Myles Chen	Long Range Information Services Planning—A Methodology	1/78
2-78	E. Burton Swanson	The Two Faces of Organizational Information	1/78
12-77	Richard O. Mason	Measures of Information Output	12/77
11-77	Ephraim R. McLean	A Chief Executive Perspective on Computer-Based Planning	12/77
10-77	Richard O. Mason E. Burton Swanson	Measurement for Management Decision: A Perspective	11/77
9-77	E. Burton Swanson Mary J. Culnan	Document-Based Systems for Management Planning & Control A Classification, Survey & Assessment	9/77
8-77	Ephraim R. McLean	A Framework for Analysis of MIS Designer Types and Design Approaches	6/77
7-77	E. Burton Swanson R. Clay Sprowls	Information Systems in Public and Not-for-Profit Organizations: Reference Materials	2/77
6-77	E. Burton Swanson	Patterns of Interpersonal Information System Use	1/77
5-77	B.P. Lientz E.B. Swanson G.E. Tompkins	Maintenance Questionnaire and List of Respondents	11/76
4-77	B.P. Lientz E.B. Swanson G.E. Tompkins	Characteristics of Application Software Maintenance	12/76
3-77	Ephraim R. McLean	The MAPP System: A Decision Support System for Financial Planning and Budgeting	10/76
2-77	Ephraim R. McLean	The Human Side of Systems: The User's Perspective	7/76
1-77	E. Burton Swanson	Data Bases and Computer-Based Inquiry: A Point of View	7/76

## Ordering Instructions

Copies of available working papers may be ordered by sending your request to:

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Graduate School of Management  
University of California  
Los Angeles, California 90024

The papers will be mailed to you along with a minimal charge for postage and handling.

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## Mason Accepts Chairmanship at USC

Professor Richard O. Mason has left GSM and the C.&I.S. program to join the faculty of the School of Business Administration at the University of Southern California (USC) as Chairman of the Management and Policy Sciences Department. Professor Mason has been associated with the C.&I.S. program at GSM since its inception, and his departure is a significant loss. However, as a friend and professional colleague who is now simply "across town," Dick will continue to be regarded as a member of our extended C.&I.S. family. We look forward to our further associations with Dick, both professionally and personally. □

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## Dates to Remember

**OCTOBER 10, 1979** — Management Systems Career Night at GSM

**DECEMBER 10-12, 1979** — Conference on The Entity-Relational Approach to System Design at GSM

**JANUARY 20-26, 1980** — A one-week program entitled "Management of the Information Resource" at GSM

**MARCH 9-11, 1980** — Conference on Application Development Systems (COADS) in San Jose, California

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This newsletter represents our continuing effort to disseminate information about Computers and Information Systems (C.&I.S.) activities within the Graduate School of Management to interested individuals and organizations. As before, comments and suggestions will be welcomed

Ephraim R. McLean, *Chairman, Computers and Information Systems*; William H. DeLone, *Newsletter Editor*; Susan Corley, *Secretary and Assistant Newsletter Editor*;

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**Computers & Information Systems Newsletter**  
**Graduate School of Management**  
**University of California**  
**Los Angeles, CA 90024**

## Bits and Bytes

Professor R. Clay Sprowls rejoins the C.&I.S. faculty after a three year absence, one as Vice Chairman and two as Chairman of GSM's Department of Management.

The C.&I.S. doctoral program continues to rank second amongst major field areas at GSM. There are currently 12 doctoral students majoring in C.&I.S. Five more students are expected to enroll in the Fall.

Mary Culnan, a C.&I.S. doctoral student, has accepted a position as Assistant Professor with the MIS group of the McIntire School of Commerce at the University of Virginia. The position is to become effective in January of 1980.

Professors E. Burton Swanson and Richard O. Mason have co-authored a book entitled *Measurement for Management Decision: Selected Readings* which has been accepted for publication by Addison-Wesley for its series on Decision Support. Professors Swanson and Bennet P. Lientz presented some preliminary results from their large-scale survey of the problems of application software maintenance at the annual meeting of the Data Processing Management Association (DPMA) in New Orleans last November. A monograph of the study, entitled *Software Maintenance Management: A Study of the Maintenance of Computer Application Software in 487 Data Processing Organizations*, will be published by Addison-Wesley as part of its Information Processing Series.

Professor Ephraim R. McLean presented a seminar entitled "The Use of Interactive Computing in Support of Management Education" at the University of Minnesota's Graduate School of Business Administration on April 5. On April 27, Dr. McLean was invited to participate in the "Workshop on Information Systems Education for MBA Students" at the University of Pennsylvania's Wharton School. □

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